VOLUME VI FEBRUARY, 1913 NO. 2

Southern Medical Journal

Journal of The Southern Medical Association

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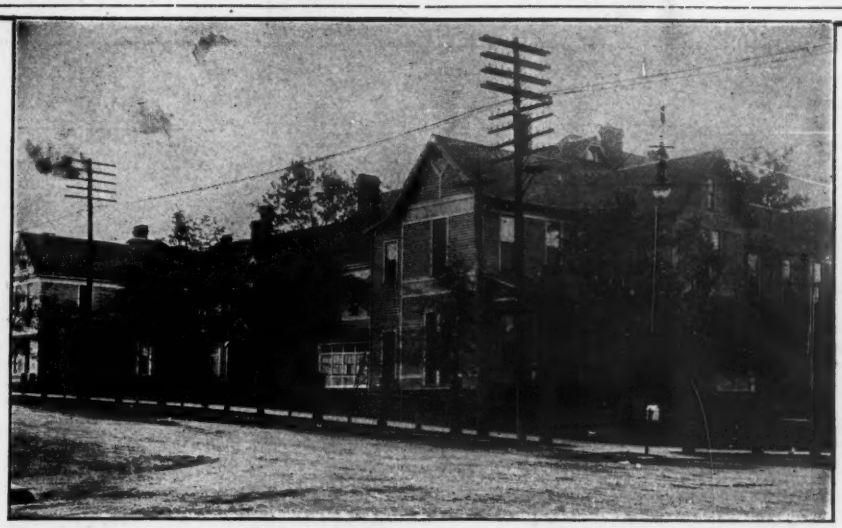

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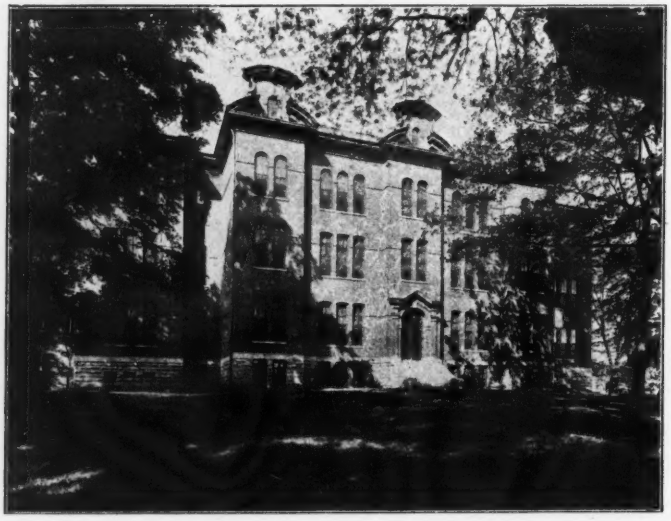

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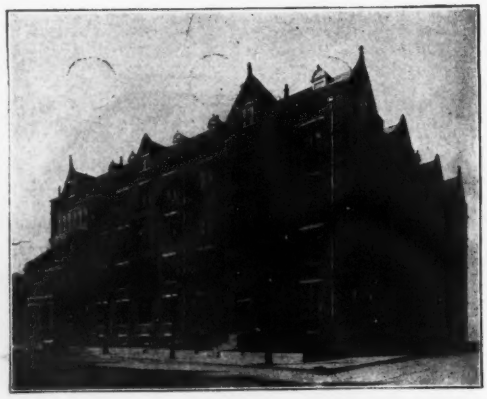

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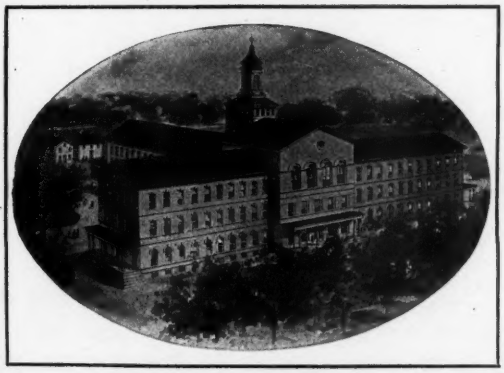

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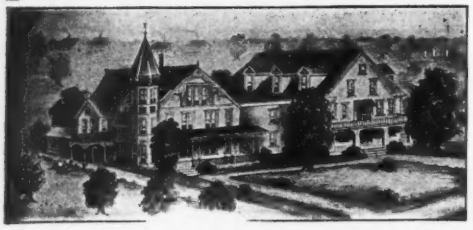

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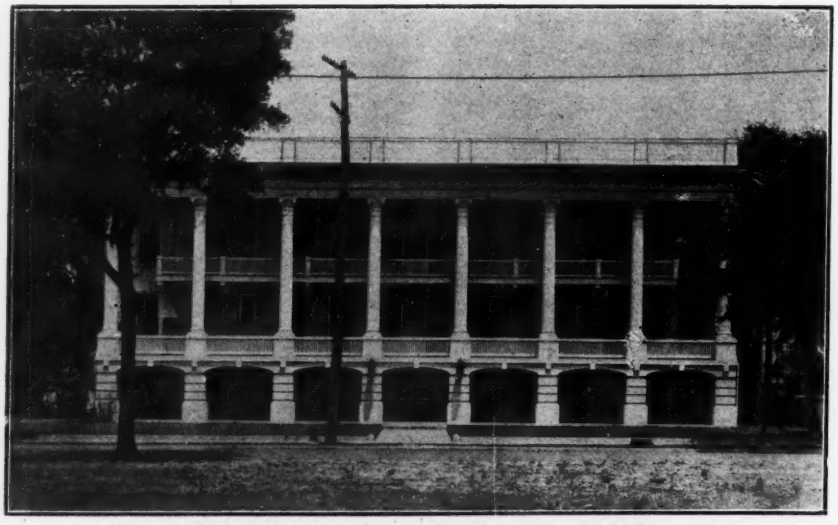

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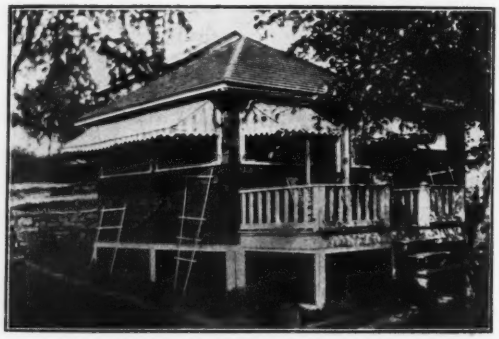

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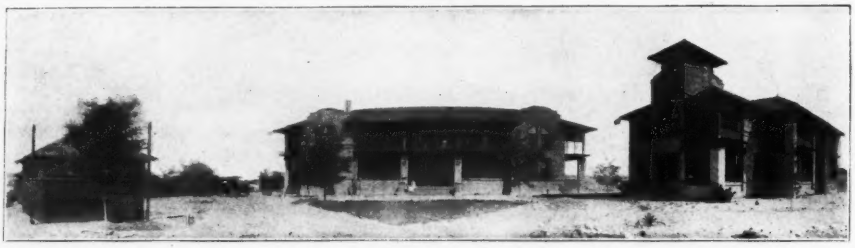

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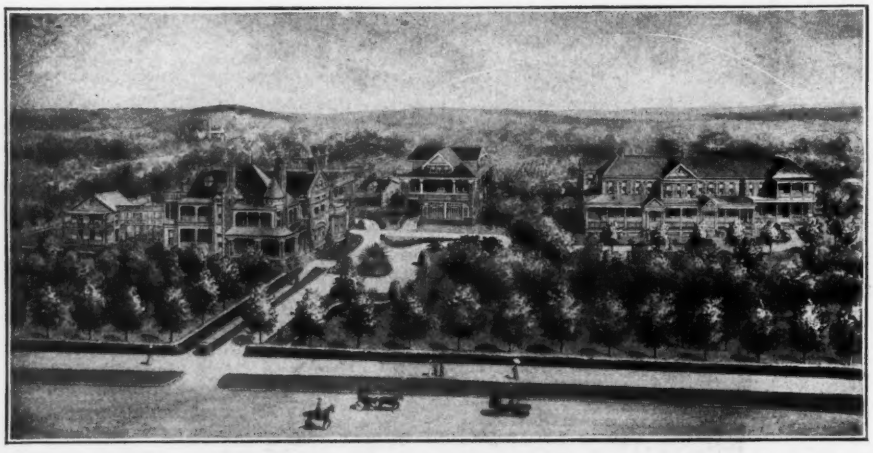

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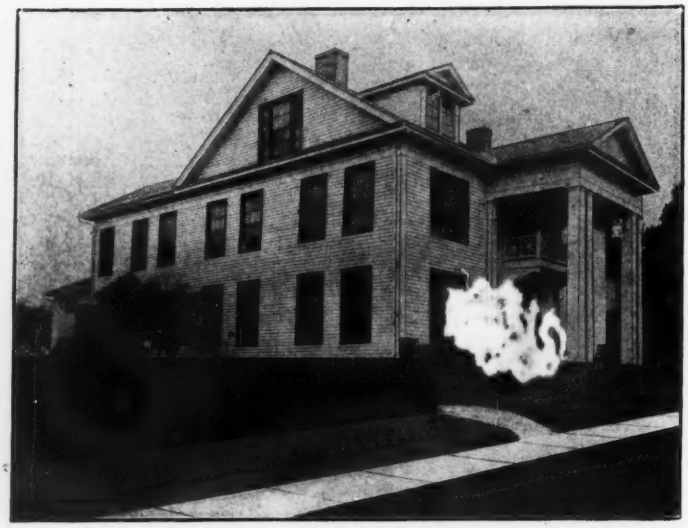

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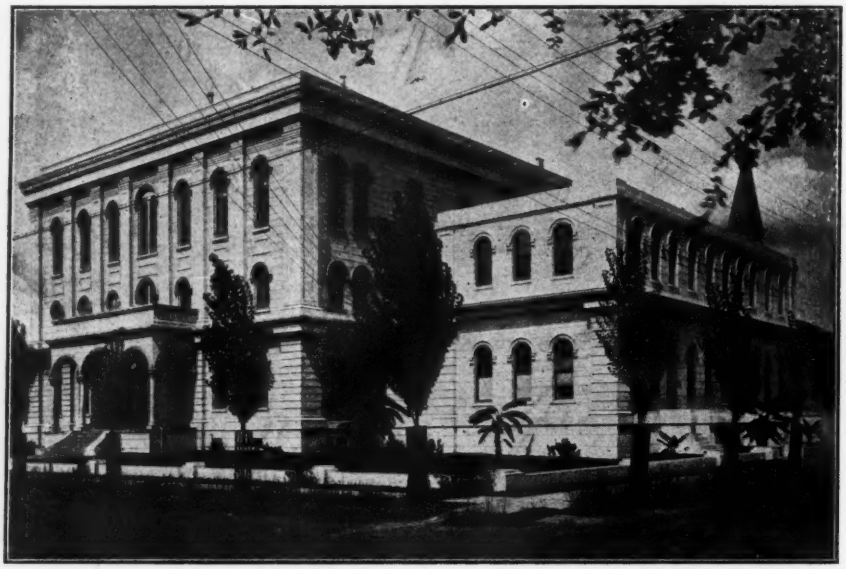

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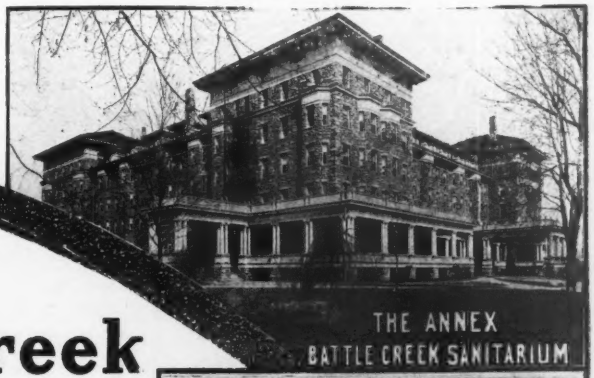

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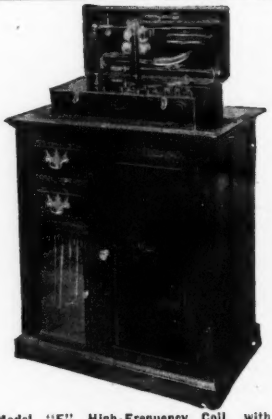

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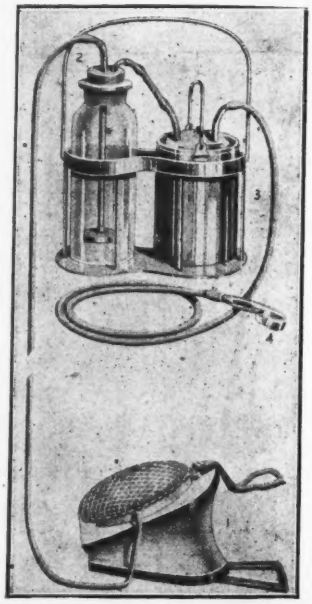

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SOUTHERN MEDICAL JOURNAL

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ORIGINAL ARTICLES

HISTORICAL RAMBLES IN SOUTHERN FIELDS.*

By ROBERT WILSON, JR.,
Charleston, S. C.

It was with no little hesitancy that I accepted the invitation to prepare for this meeting an address upon some topic pertaining to Medical History in the South, fully realizing as I did the magnitude of the undertaking, if properly performed, as well as appreciating most keenly my own limitations. But the pleasure which I have found in studying the neglected and half-forgotten records which our forbears left behind them, and the fresh inspiration which has come to me from the story of their struggles and achievements induced me to yield consent, and so I am here today to speak briefly concerning some of the medical men of former days who labored in the South, feeling that however inadequate my treatment may be "on any terms whatsoever you will not grudge to wander in such neighborhood for a while."

To range freely over the whole field of Southern medical history would consume more time than can be spared for an address of this character, even if I possessed the qualifications for so large a task. I shall, therefore, content myself with selecting from the territory which is most familiar to me a few whose lives will serve to illustrate the varied activities and, to some extent, the remarkable achievements of Southern physicians.

The South has had a proud medical record. From the earliest colonial period until the present day there has been a long line of brilliant physicians who have distinguished themselves not only in medicine and in surgery, but also in public life, in letters, and in scientific pursuits such as botany, geology, mineralogy, chemistry, conchology, and paleontology. A few have been men whose works have filled the world with their fame, but of these it is not my purpose to speak. The names of Marion Sims, of Crawford W. Long, of Benjamin Winslow Dudley, of S. D. Gross, of Hunter Maguire, of Ephraim McDowell are as familiar in our mouths as household words, and the luster which they shed is our common pride, but the story of their lives has been told so often that I need not pause to dwell upon them. In addition to these there have been a large number whose lives of noble effort, patient toil and worthy achievement teach lessons of courage and sacrifice, men who adhered to the highest ideals of service, whose purity of purpose was untarnished and whose catholic breadth was unaffected by the "narrowing lust of gold."

To preserve these records should be our pride as it is our duty—our duty to the men who established the foundations of medicine in the South; our duty to ourselves if we would profit by the inspiration of noble example.

A considerable amount of work has been done already by a number of writers who have published monographs, journal articles and addresses, the most notable recent work being Dr. Kelly's Cyclopedia of American Medical Biography. But an immense amount of material remains untouched, much of which will be lost if no effort is made to preserve it. Would it not be appropriate for the Southern Medical Association, in addition to its scien-

*Address before the sixth annual meeting of the Southern Medical Association, Jacksonville, Fla., Nov. 12-14, 1912.

tific work, to make a systematic effort to gather together and preserve in permanent form the records of our past? Surely such an undertaking would be worth while. Perhaps if judged by the commercial standard of values, it might be regarded as not altogether useful, but "to be always seeking after the useful," as Aristotle remarks, "does not become free and exalted souls."

The first physician we of the South may claim was one Thomas Wotton, Surgeon-General of the London Company, who was a member of the famous expedition which settled at Jamestown in 1607. Very little is known of Wotton, and he is mentioned here only for the sake of marking the beginning.

We meet with few, if any, who are scarcely more than names such as Russell and Bagnall, until we come to one whose extraordinary career reads like a romance, "Mr. Henry Woodward, a chirurgeon," who accompanied the expedition of Robert Sandford to Port Royal in 1666. When Sandford returned to Cape Fear this advenurous pioneer voluntarily remained behind among the Indians at Port Royal in order that he might acquire a knowledge of their customs and language that might be of service to his countrymen. It is a high tribute to Woodward that the natives treated him "with greatest love and courteseye that their rude natures were acquainted withal." The knowledge gained among the Indians by this pioneer physician and the good-will which he won were probably the means of saving the settlers at Charlestown from starvation a few years later. In 1671 he traveled by land to Virginia and made extended expeditions in search of precious metals.

Dr. Woodward was a splendid example of the best and highest type of the physician who with determined courage and careless of life labors to extend the bounds of knowledge for the benefit of his fellow-men. His name is extinct, but his intrepid spirit and his bold genius have survived through more than two centuries in the blood of his descendants, among whom have been numbered many of the most prominent sons of the South—men who have distinguished themselves in letters, in law, in statesmanship, in journalism, in theology, in medicine and in science.

In the early days of the settlement, physicians took a prominent part in the affairs of the province, one Dr. Christopher Dominick having been made Casique with a grant of twelve thousand acres of land from the Lords Proprietors. Nothing more is known of Dr. Dominick, but he must have been a man of some consequence. Already in 1698 a quarantine measure had been adopted in the province of Carolina, being the second such measure on record in the American colonies, that of Massachusetts in 1648 having been the first. It is interesting to note in passing that the gunshot method of enforcement, somewhat familiar in the South in later times, was already instituted at this early date.

After the establishment of the Royal Government several physicians of a high order of ability came to Carolina, among whom were Dr. John Moultrie, who reached the head of his profession in the young colony, and Dr. John Rutledge, who also won a high position. It was Dr. Moultrie's son, John, likewise a physician, who became Lieutenant Governor of Florida during the Revolution. But among physicians who in colonial days took an active part in public life none ranked higher than William Bull. Dr. Bull was probably the first American, as he was the first native born South Carolinian, to obtain his degree in medicine, having graduated at the University of Leyden in 1734, where he was a pupil of Boerhaave and a friend of Van Swieten, who alludes to him as "the learned Dr. Bull." If Dr. Bull practiced medicine it must have been for a brief period, for he soon appears in public life, and like his contemporary, the distinguished Dr. Cadwallader Colden, of New York, became the Lieutenant Governor of his province. In such high esteem was he held by his contemporaries because of his rare

judgment and his sense of right and justice, that many believed that had he been appointed dictator of the American provinces the Revolution might have been averted. Remaining loyal to the master under whom he held office, Dr. Bull left his home and took up his residence in London, where he died shortly after the Revolution.

In these early days the University of Edinburgh perhaps exerted the strongest influence in this section of the South, and the Library of the Medical Society of South Carolina contains several volumes of manuscript notes of Cullen's lectures brought home by students. Here it was that John Moultrie was educated, and later Tucker Harris, Samuel Wilson and others who at the end of the eighteenth and the beginning of the nineteenth century were influential in guiding medical affairs in South Carolina.

From Scotland, too, came that remarkable group of men who made Charleston famous as a scientific center in the middle of the eighteenth century, John Lining, Lionel Chalmers and Alexander Garden.

Dr. Lining was not only a successful practitioner of medicine, but a scientific investigator as well. He was probably the pioneer physiologist of America. His experiments and observations upon himself, in which he made an attempt to correlate the amount of sweat, urine and feces with the changes in temperature, measuring and weighing throughout the entire year every particle of food and drink that passed his lips, as well as all excretions, were exceedingly interesting, even if not of permanent value. "What first induced me," he writes, "to enter upon this Course was that I might experimentally discover the influences of our different Seasons upon the Human Body, that I might arrive at some more certain Knowledge of the Causes of our epidemic Diseases, which as regularly return at their stated Seasons as a good Clock strikes Twelve when the Sun is in the Meridian, and therefore must proceed from some general Cause operating uniformly in the returning different Seasons."

Dr. Lining also made extensive meteorological observations, which were probably the first made in the British Colonies, and wrote articles on yellow fever and on electricity. He was a friend and correspondent of Franklin, and in May, 1753, he repeated Franklin's famous experiment performed the year previous, of flying a kite in a thunderstorm and causing a discharge of electricity therefrom, a full and interesting account of which was published in the form of a letter to Charles Pinckney, Esq., in the Philosophical Transactions in the following year.

Lionel Chalmers likewise made valuable meteorological observations, his most important work being "An Account of the Weather and Diseases in South Carolina," of which Mumford says: "Few compositions of that day are pleasanter reading." It is interesting to read that in those early times the negroes, who were already more numerous than the whites, were equally susceptible as the latter to all kinds of diseases with the exception of yellow fever and gout. In his "Essay on Fevers," Chalmers developed the so-called spasmodic theory of fever, in which he set forth the view that the cause of fever was a "spasmodic contraction of the arteries and other muscular membranes," anticipating the theory of the famous Cullen.

But among Colonial physicians Dr. Alexander Garden stands easily first. He was a man of great culture, a practitioner of ability and a botanist of distinction. It was in honor of him that Linnaeus named the beautiful flower that bears the name Gardenia. A sufficient testimony of his high standing in the scientific world was his appointment as a Fellow of the Royal Society of London.

One of the most distinguished physicians of the Revolutionary period was Dr. David Ramsay, friend of the celebrated Dr. Rush. Dr. Ramsay settled in Charleston in 1773, and took an active part in the stirring events of that time. After the Revolution for several years

he was a member of the Continental Congress, acting as President pro tem. for one year during the illness of John Hancock. Dr. Ramsay is best known by his historical works, although he made several contributions to medicine. His princpal works were: "History of the Revolution in South Carolina," "Sketch of the Soil, Climate, Weather and Diseases in South Carolina;" "A Review of the Improvements and Progress in the Study of Medicine in the Eighteenth Century," "Life of Washington," "History of South Carolina," "History of the United States," "A Dissertation on the Means of Preserving Health in Charleston," "A Biographical Chart on a New Plan to Facilitate the Study of History," "Eulogium on Dr. Rush."

Time does not permit more than a passing mention of Dr. Joseph Johnson, author of "Reminiscences of the Revolution in South Carolina," a valuable collection of anecdotes and narratives of places and people; of Peter Fayssoux, founder of the Medical Society of South Carolina; of Budd, and Irvine, and Lynah, who served their country during the Revolution; nor of Poinsette, and Wilson, and Barron all of whom were exemplars of the best professional culture. It was among this group of men that the third oldest medical library in the United States originated, when Robert and Samuel Wilson, in 1791, donated their private collection of books to form its nucleus.

These are the men who made Charleston famous as a center of learning and culture. If Ramsay can be relied upon, "there were more experiments made, more observations recorded and more medical writings ushered into public view by the physicians of Charleston than of any other part of the American continent."

There is one more Southern physician belonging to this early period whom I wish to mention, John Mitchell, an Englisman by birth, who settled in Virginia in the early part of the eighteenth century. Dr. Mitchell's special predilection was for botany, and although spending the life of a quiet country practitioner, he acquired wide distinction as a man of scientific attainments, several new genera of plants having been described by him. It was in honor of this early American botanist that Linnaeus named the partridge vine *Mitchella Repens.*

In later years there were quite a number of Southern physicians who attained considerable distinction in the world of science, chief of whom we may mention James E. Holbrook and J. Lawrence Smith. Dr. Holbrook was a member of the first faculty of the Medical College of South Carolina, occupying the chair of anatomy, and all who enjoyed the privilege of learning this science under his guidance bear witness to the exquisite charm of his lectures. Dr. Holbrook's principal life work was embraced in his Monograph Upon the Reptiles of the United States. This work, which attracted attention abroad as well as at home, included descriptions and illustrations of one hundred and forty-seven nominal species. Twenty-nine new species were named by him, most of which are still retained with his specific names. He later planned a companion work on fishes, only a portion of which was ultimately completed.

Dr. J. Lawrence Smith practiced medicine for only a brief period, during which time, however, he founded and for a while edited the Charlestown Medical Journal. Dr. Smith's principal work was in chemistry and mineralogy and so high a position did he attain that the Institute of France selected him to succeed Sir Charles Lyall upon the latter's death.

Less widely known, but exceedingly gifted, was Dr. Lewis R. Gibbes, who claimed all science as his province, excelling in mathematics, in physics, in astronomy, in chemistry, in botany and in zoology. Dr. Gibbes wrote comparatively little, but was an ardent and untiring worker. Louis Agassiz paid a high but just tribute to his ability and thoroughness, when, in reference to a certain investigation, he remarked that "inasmuch as Gibbes has

gone over the subject, no further research was necessary."

Under the inspiration of Holbrook and Agassiz, still another Charleston physician, Dr. St. Julien Ravenel, abandoned the practice of his profession and devoted himself to the pursuit of science, especially to chemistry. His principal work was in the field of agricultural chemistry, in which he exhibited an extraordinary fertility of genius. It was Dr. Ravenel who discovered the value of the phosphate deposits in South Carolina, which have exercised such an enormous influence upon the commercial development of the state. It was his inventive genius, too, which conceived and produced the first torpedo boat, the "Little David," which figured so heroically in the blockade of Charleston.

His relative, Dr. Edmund Ravenel, achieved wide distinction as a conchologist. His private collection contained 3,500 species of land, fresh water and marine shells from all parts of the world and his catalogue of shells, published in 1834, was the first American work of the kind.

Botany has proved an attractive field to American physicians in later years as well as to those of the early period, one of the most devoted students of this branch of science being Dr. F. Peyre Porcher. The scope and importance of his work may be indicated by the following works: "Sketch of the Medical Botany of South Carolina," 1849; "Medical, Poisonous and Dietetic Properties of the Cryptogamic Plants of the United States," 1854, and "Resources of the Southern Fields and Forests," 1863-1869, the first edition of the latter having been published by order of the Surgeon General of the Confederacy.

The first Southern physician, as far as I am aware, who received the honor of being elected to the Presidency of the American Medical Association was Dr. James Moultrie, who, also, as delegate from the Medical Society of South Carolina, had taken an active part in its organization. Dr. Moultrie was a physiologist of extensive reputation and was a member of the Societe de Medicine de Marseilles and the Societe Phenologigue de Paris. His views on medical education were far in advance of his day. In 1824 he declined a chair in the newly organized Medical College of South Carolina, upon the ground that failing to secure an appropriation the venture could not be made a success, and in 1836 he strongly advocated the adoption of a course of study which should cover four terms of nine months each modeled upon the pattern of the European universities.

Associated with Dr. Moultrie was Dr. Samuel Henry Dickson, founder of the Medical College of South Carolina, and first occupant of the chair of the Practice and Principle of Medicine in that institution. Dr. Dickson was the author of a text-book on medicine, as well as a number of short articles and essays. He possessed a charming literary style, which is particularly striking in his shorter writings.

It is not given to many to be active in the founding of two colleges, but such is the record of Dr. Charles Caldwell, who was instrumental in the organization of the Medical colleges at Lexington and Louisville, Ky. Dr. Caldwell is said to have excelled as a teacher, possessing unusual eloquence as well as a rare grace of manner. In spite of an egotism that could boast that he "has written more and written upon a greater variety of subjects than any man America has produced," he was, nevertheless, a man of considerable talent. He was strongly opposed to the view of Rush upon the contagiousness of yellow fever and wrote most vigorously in opposition to it.

In the department of surgery, there is nothing worthy of record during the eighteenth century, but in the marvelous development of this particular field of practice in the nineteenth century, the South may claim its full share of brilliant workers. Resisting the temptation to recount once more the wonderful achievements so familiar to all, I shall recall to memory a few of those whose work is

less well known. At the beginning of the century two young men began the practice of medicine in Charleston, S. C., each of whom achieved a wide reputation in the domain of surgery, Benjamin Bonneau Simons and Joseph Glover. Dr. Simons had been a student under John and Charles Bell, and it was he who did the dissections for their famous anatomical plates. Turning his back upon a splendid opportunity which seemed open to him in Europe, he returned home, where he became one of the leading surgeons of the South. Dr. Simons is reputed to have been the first man to trephine bones for abscess, and he also performed one of the first successful operations in South Carolina for stone in the bladder. He was one of the few Southern men who have published medical books, being the author of a valuable work on the bones.

Dr. Joseph Glover, who had graduated from the University of Pennsylvania in 1800, performed in 1801 excision of the spleen, one of the first cases, if not the first, upon record. The case was that of a negro who had been stabbed in the left hypocondriac region, the cartilages of two of the false ribs having been divided, with protrusion of a portion of the omentum and a part of the spleen. The protruded omentum and a large portion of the spleen were cut away and a branch of the spleenic artery secured with a ligature. The external wound was closed with sutures. This operation, which was successful, attracted considerable attention at the time. Another achievement of Dr. Glover's was a revival of the operation of puncturing the head with subsequent compressions for the cure of chronic hydrocephalus; the New York Medical Journal of July, 1818, makes the following comment upon this operation: "We are indebted to that ancient and respectable institution, the Medical Society of South Carolina, for the publication of this case, one which extends the practical domain of surgery, discloses new physiological phenomena and withal furnishes us with new and interesting facts respecting a fatal and frequent disease." In 1813 Dr. Glover performed the operation of hysterectomy four years after McDowell's famous ovariotomy.

In 1806 the first hip joint amputation performed in America was done by Dr. Walter Brashear. Dr. Brashear was a native of Maryland, but when eight years of age moved to Kentucky and later took up his residence in Louisiana. He did not follow up this remarkable achievement, as might have been expected, with other work of the same order, nor indeed did he devote his undivided energies to the practice of his profession, a part of his time having been given to public life, in which field, however, he was so successful that he was called upon to represent his adopted state, Louisiana, in the United States Senate. Another Kentucky surgeon, Dr. Charles McCreary, was a pioneer in the complete removal of the clavicle, his operation antedating that of Valentine Mott by sixteen years. Among other pioneers we find the names of Josiah Clark Nott, founder of the Medical School of Mobile, Ala., who first performed extirpation of coccyx for inflammation; Dr. R. A. Kinloch, of South Carolina, who originated the method of suturing the fragments in fractures of the lower jaw, and who also was the first to perform laparotomy for gunshot wounds of the abdomen, an operation which had been suggested by Gross and Sims; Dr. F. L. Parker, who in 1881 reported a case in which he had sutured the divided ends of the posterior interosseous nerve with perfect success, complete recovery following the operation.

But time does not permit me to continue, loth as I am to pass with merely a mention of such names as Eli Geddings, John Bellinger, John Wagner, Julian Chisolm, Ogier, Wragg, Warren Stone, Paul F. Eve, H. H. Mudd, the eloquent David W. Yandell, John Peter Mettauer, who apparently preceded Sims in suggesting the possibility of curing vesico vaginal fistula, and a number of others who occupy a prominent place in Southern medical history.

Perhaps some whom I have passed are even more worthy than those I have included, but I have purposely made no effort to treat the subject with any degree of fullness; indeed, all that I have attempted has been merely to suggest the wealth of material that may be found in the South. If I have succeeded in stimulating in some degree an interest in medical history in the South and aroused a desire to gather together and preserve our neglected records, I shall have done all that I set out to accomplish.

CONCERNING THE PATHOGENESIS OF RELAPSES IN MALARIAL FEVERS.*

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As is known, since the researches on the cycle of the malarial parasites in anophelene mosquitoes, the problem of the treatment of malaria has assumed a very great social importance, considering that the specific treatment of human illness represents a method of social prophylaxis to which is given more trust than to any other.

But anyone who has a knowledge of malaria knows the difficulties which are not seldom encountered in the task of treating obstinately relapsing infections. It is not unusual to observe sick persons who, after a long series of relapses, have become so skeptical in regard to the efficacy of quinine that they refuse to continue taking the remedy.

And inasmuch as various facts bring me to the belief that the relative resistance of relapsing malarial infections to the valuable drug may be in intimate relation with the pathogenic mechanism of such infections, I think it is of advantage, on account of the practical importance of my argument, to explain certain considerations bearing on these facts,. although I may not deal in great part with anything new.

It is almost useless to call attention to the fact that one of the most debated and obscure questions in the pathology of malaria is precisely that which concerns the genesis of relapse; these, as every one knows, are found in all kinds of malarial infections, sometimes separated by brief intervals of apyrexia, sometimes by long periods of latency.

It is also known that relapses may happen one after the other with a certain regularity. For in sick persons who take quinine only in sufficient quantity to cause a cessation of the fever, and who then suspend the use of the drug, it is especially observed that relapses return at intervals a little short of two weeks; intervals, as I have noted formerly, that approximate the medium duration of the period of incubation of the original infection. Again, it is not unusual to observe malarial fevers that relapse at intervals of about a month. But as far as I am aware the truth is less generally known about those fevers in which, after a long period of latency, relapses occur at certain seasons, so that it seems as though such relapses follow a definite law, for only recently this type of malarial recurrence has received attention. For instance, it is not uncommon to witness tertian malaria relapse in the spring, after remaining latent throughout the winter; and there are also estival fevers (estivo-autumnal infection, due to *P. falciparum*)* that, after remaining entirely dormant during the winter and spring, relapse at the beginning of summer.

For example, I had occasion to observe a patient, who had incurred fever in the summer of 1901 in Trinitapoli; after remaining entirely well throughout the winter and spring of 1902, he relapsed on the 25th of June of that year with a grave malarial attack, during

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*Translator's parenthesis.

which asexual estivo-autumnal parasites were found in the blood, but no crescents. Of course, during the entire period of latency he had not exposed himself to the possibility of incurring a new infection. Nor would it be difficult for me to refer to other cases similarly well observed.

For some time various students of the factors concerned in malarial infections have supposed they could affirm that these estivo-autumnal relapses in the beginning of summer, after long latency, are due to a regular phenomenon that is manifested in a great number of sick persons, so much so that these observers believe these relapses may be due to accumulations of gametes from which anopheles are infected, thus producing again estivo-autumnal infections. In this way the new epidemic year is begun*. I cannot say, from my experience, if these facts to which I have just alluded possess very much importance from the epidemiological viewpoint, for, in truth, in malarial localities, it is very difficult to distinguish between a relapse and a reinfection in the inhabitants of these, and all criteria that have been suggested for the interpretation of the matter seem to me to be very arbitrary. The clinical course, for example, upon which some depend, is not to me a sure criterion; it is true that as a rule primary infections are graver, lasting longer than the attacks of relapse, but this happens in persons who hitherto have not had fever, while in a patient formerly a malarial subject a new infection cannot by any character be told from a relapse.

While I can, then, from my own experience affirm the occurrence of a relapse after a long period of latency, and at the beginning of the epidemic year, I cannot say if this happens with that regularity which would make the fact useful. If this be true, very great importance could be attributed to it from the epidemiological viewpoint. This point, and others, are questionable, and it is not essential to my purpose to go to the bottom of the matter, so that I limit myself to this brief notice.

As for the genesis of relapse, it is necessary to recognize that it is not yet known precisely in what forms the malarial parasites are found in the intervals of apyrexia between the febrile accesses, or to what biological property of these parasites may be attributed the fact that there are relapses of the fever.

All the hypotheses of the various authorities who admit that in man the gametes can multiply by means of parthenogenesis are worthy of being noted here. Although such a proposition may have been listened to in general with favor (some, for instance, believe that the epidemic year, at the onset of summer, begins with a group of relapses determined in old malarial cases by a "springtime parthenogenetic reproduction," as they say, of gametes), I maintain that such an hypothesis not only lacks a firm base of facts, but does not even lend itself to a satisfactory explanation of relapses.

The opinion that by the parthenogenesis of gametes relapses may be explained has as a positive foundation solely the observation of Schaudinn. (1) He, at the beginning of a relapse in a case of tertian malaria, saw and pictured a series of modifications in the macrogametes (female sexual parasites), which he thought he could interpret as similar to the forms of asexual multiplication. He reproduced in a plate the various forms that he found, placing them as in an ordinary developmental cycle. Then he adds that he has seen in other cases also some similar forms, but it is a fact that only once, and in a single patient, the whole series of forms in question has followed at the beginning of a relapse.* Notwithstanding this, he, after he had given a most accurate description in his report, expressed the *conviction* that relapses after long intervals owe their origin to macrogametes, which live a long time, and have the power, according to him, of undergoing a reversion to the form of schizonts (asexual parasites).

Although the publication of Schaudinn was put out in 1913, the process that he describes has not had even the most infrequent and insufficient confirmation by new observations.* The unconfirmed opinion based on that report has been listened to with favor, as though it were a datum of fact at this time unassailable.

I cite the observations of some Dutch authors, the only ones, as far as I know, who have also seen the forms described by Schaudinn.

Dr. G. I. Van der Hilst Karrewij (2) has taken

*The Italian school refers to the period of the annual increase and decline of malaria as the "epidemic year."—Translator's note.

up again the study of the disputed point, not having found other publications since those of Schaudinn. He in one case only of tertian malaria has found a series of forms that suggest to him a cycle of evolution in the macrogametes, precisely at the onset of an attack, and he describes the forms that he saw in the same manner as did Schaudinn. We have to do, then, with a simple confirmation of the observations of the latter, whose designs, it may be noted, are neater and demonstrate the points better than those that accompany the report of Karrewij. It should be noted that the patient with the tertian malaria who was the subject of Karrewij's observations already had had several attacks of fever when that one unexpectedly occurred at the beginning of which Karrewij found the forms described as demonstrating the parthenogenesis of the gametes.

Now, it is evident that, to explain the cause of relapse, we would expect to find the said forms at the beginning of the first attack of the relapse itself, while everything tends to the belief that the following febrile attacks in a relapse are produced, as a rule, by the regular multiplication of the forms pertaining to the pyrogenous cycle. Therefore, the observation of Karrewij is not important concerning the origin of relapse, in the strict sense of the word, but would also lead to the belief that in the ordinary sequence of attacks the gametes might reproduce themselves either entirely or in company with the other forms of the parasites.*

Nor can I agree with Karrewij when he states that parthenogenetic division has been observed several times in crescents, and cites as confirmation the observations of Grassi, Mannenberg and Ziemann; these observations in my opinion, refer solely to isolated and incomplete reports, which hint at a transverse division of crescents, and they lack entirely value of demonstration in respect to the question which at present concerns us.

Similar observations to those of Karrewij in tertian malaria have been made, in the Dutch East Indies, by G. J. Merz and M. Bluml (2).. There is this that is new in the results of these authors: in six preparations of blood from five persons sick with tertian malaria, they found forms that they interpret macrogametes in asexual division, and at the same time schizonts in division were also present. It is worthy of note that they had to do these cases with very heavy infections; so heavy were these that the authors found regularly double infection of the erythrocyte, more than once four tertian parasites in the same red blood cell, and in one as many as six schizonts. Schizonts in division were most plentiful, from 140 to 160 in a single preparation, nor were double infections of erythrocytes with gametes and schizonts lacking.

Now, to diagnose macrogametes in division, and to distinguish such from the numerous schizonts that were found in division at the same time in the preparations, the authors above mentioned relied on the description given by Schaudinn, and admitted without further proof that the distinctive characteristics of macrogametes in division had been previously ascertained and definitely postulated.

This simultaneous occurrence of macrogametes and schizonts in division, together with the fact that they were not able to state definitely in two of their cases whether a relapse or a reinfection were present, but rather had to admit the possibility of the latter supposition, naturally caused Merz and Bluml to think that the division of the macrogametes might not be the sole cause of the onset of relapse, as Schaudinn thought, but that to such division had been given too great value and broadness of meaning. But now, without following these authors in their attempts to give a satisfactory interpretation of the phenomenon, I shall content myself with noting that they have not seen the series of forms in question at the beginning of a relapse, and that, relying on the single observation of Schaudinn, they admit the relation between relapses and the multiplication of gametes. The same completeness, which constitutes the new and interesting data in their report, takes away, in respect to the question of relapse, its demonstrative value.

The observations of H. M. Neeb (3) are even less conclusive than those that I have mentioned. He refers in his work to having seen in tertian malaria some forms similar to those described by Schaudinn, and adds drawings and a description of three forms of parasites which he interprets as crescents in parthenogenesis. He found these in two preparations from a patient ill with tropical fever, but does not

*An excellent account of Schaudinn's work, with reproductions of his plates, is given in English by Deaderick, Practical Study of Malaria, 1909, p. 124, et seq. In the Journal of the Royal Army Medical Corps for December, 1909, Major W. S. Harrison gives an account of a similar phenomenon observed in the gametes in a case of relapse in tertian malaria, and his illustrations, which were made before he saw those of Schaudinn, are practically identical with the latter's, and with similar forms not infrequently seen here by me in tertian and quartan infections. Maj. Harrison does not commit himself, however, to a definite statement that his forms are undergoing parthenogenesis. It is also of interest to note that Captain C. F. Craig, U. S. Army Medical Corps, interpreted similar forms shown by me to him as the result of conjugating parasites. My personal opinion at the present time is that the forms I have observed are due to the atypical sporulation frequently seen in anemic blood, such as is common in those who suffer from relapse, but I am not prepared to make a definite statement at present. This information is appended solely for the guidance of those interested, and to confirm the statement that the forms described by Schaudinn actually occur, not in any way as a comment or a criticism on the views of Bignami, Schaudinn and others on the subject.—W. M. J.

*Dr. Bignami evidently is not familiar with the observation of Major Harrison, which should receive the credit due the careful statement of fact by an experienced and unprejudiced observer.—W. M. J.

*That is, Dr. Bignami questions whether the attack observed by Karrewij were really a relapse, for it followed unexpectedly other attacks of fever. Now, if this parthenogenesis actually has explanatory value in this instance, this value does not pertain to the cause of relapse, but merely shows that in the course of a malarial attack the phenomenon was observed. In other words, here the phenomenon means no more than ordinary asexual multiplication would mean, for there is no proof that it was part of a true relapse. (Translator's note.)

state how long the fever had lasted. It is, however, true, that the opinions expressed by various observers who examined Neeb's specimens were not in agreement as to two of the forms, although Prowazek interpreted them as parthenogenesis forms of crescents; Le Dantec showed the similarity of these same forms to the ordinary schizogony of estivo-autumnal parasites, and was reserved in his judgments. Others, of the Institute of Tropical Diseases in Hamburg, expressed the opinion that the forms were macrogametocytes (male crescents) in which the chromatin had already divided in the phase preceding the formation of the microgametes (flagella). As for the third form in question, Neeb himself admits that he cannot give a precise opinion.*

The above facts, if I mistake not, are very far from being sufficient to convince us that relapses are due to schizogony of the macrogametes. They treat isolated observations which may, in some respects, demonstrate the possibility of parthenogenesis, but they do not permit us to affirm that such a process happens regularly at the beginning of a relapse. In fact, the proof of the constancy of such occurrence, and of the regular production of the phenomena in exact correspondence with the first access of relapse at long intervals, is lacking. Now it is not out of place to record that many students of malaria have patiently sought the phase of multiplication of crescents in the beginning of relapses, without success in demonstrating such a fact. Further, such researches have been made by Bastianelli and myself since the biological significance of crescents was first known; that is to say, when it seemed necessary that the phase of multiplication of crescents ought to exist in the blood of man. If all this is considered I believe that before firmly maintaining that Schaudinn is correct in his interpretation of the genesis of relapse,* we should take up new methodical researches, which at present are lacking, and that these should be carefully followed through, using staining methods best adapted, especially for estivo-autumnal gametes, which, as is well known, have morphological characteristics better differentiated and more easily distinguished than are those of the gametes of the other species of malarial parasites.*

There are very noteworthy facts, as to parthenogenetic reproduction, in other parasites; but, although analogy can be a guide in research, in this instance we cannot value it as a base for an hypothesis, when direct research in a well-known group of parasites does not furnish us with sufficient data to corroborate analogous findings in other groups. That the hypothesis (parthenogenesis) does not furnish an adequate basis of fact for the present conclusions, especially those for the estivo-autumnal species, is plain from the observations made many years ago by Bastianelli and myself on the behavior of crescents in human blood, observations that our recent researches have confirmed. So that, although it is admitted such a thing as the parthenogenetic reproduction of crescents in man may be possible, this hypothesis does not in any way help the interpretation of the cause of relapse, as is shown by the data just presented.

Nothwithstanding what is urged in favor of parthenogenesis as a cause of relapse, there are not infrequently recurrences of estivo-autumnal fever, at the beginning of which it is not possible to find crescents, even though splenic puncture be done, as has been noted in other works. In several instances, in the intervals of apyrexia between one relapse and the other, in persons who had chronic malaria, I have made examinations of the splenic juice without success in finding a crescent. On the

*In the Journal of Tropical Medicine and Hygiene, Volume XIII, No. 7, April 1, 1910, under the title of "The Parthenogenesis of the Female Crescent Body," Dr. Neeb gives in full detail the account referred to by Dr. Bignami, and also a plate showing the three forms in question, with tertian macrogametes in parthenogenesis also. Although Dr. Neeb had not seen the criticism of Dr. Bignami, as the two publications are of about the same date, he takes up in this article in great detail an explanation of the objections urged against his views by Dr. Bignami. (Translator's note.)

*I assert that this reserve should be maintained, although Ruge Handbuch der pathog. Microorganismen, Heraus von Kolle und Wassermen, Erganzungsband. Zweites H., page 416) considers the question of the pathogenesis of relapse now cleared up by the observation of Schaudinn on tertian malaria. (Author's note.)

*Such researches have been taken up this year in my laboratory. (Author's note.)

other hand, in quartan malaria, in which relapses often happen from month to month, gametes are extremely scarce, as has been shown by the negative results that have occurred repeatedly when it has been tried to infect anopheles mosquitoes with quartan parasites. Now it seems little likely that in such instances the cause of the continuance of the infection is due to forms of the parasites that occur very infrequently.

According to observed facts, it can be admitted that a portion of relapses are in connection with the recrudescence of pathogenetic reactivity of schizonts that carry on regularly their life cycle for a more or less lengthy period, without giving rise to fever. This is easily observed in quartan parasites, in whom the life cycle of the parasites can be followed in the finger blood to sporulation, and also through various generations, without the production of corresponding febrile attacks. In another work, in speaking of immunity, I have noted this fact, and I proposed to interpret it by admitting that the patients in question had acquired a transitory immunity against the fever producing activities of the hemosporidia. When this immunity is suspended, especially after some such occasional cause as chill or overwork, relapses follow.

Facts similar to these cited, such as the presence of parasites in the blood without accompanying febrile phenomena, have been observed recently by various authors, especially in the races resistant against malaria.

In such instances it cannot be doubted but that relapses may be due to the parasites of the pyrogenous cycle, which have been living in the blood without developing manifest pathogenic activity, such as the production of a febrile attack, on account of the particular condition of the patient at the time.

In considering the continued development of schizonts under such conditions, another group may be thought of; that which goes on in its cycle when cinchonization is not sufficiently prolonged and intense, such parasites escape the action of the remedy. Analogous examples are furnished in other infections, such as syphilis, in which a part of the virus escapes the specific cure, and by the cause of the later manifestations in the disease known as sleeping sickness, etc. Similarly the genesis of relapses at intervals rather short and more or less regular that present themselves frequently in those sick persons that are not treated adequately may be determined. As noted above, the period that intervenes between one group of febrile attacks and another sometimes has a duration that approaches that of the incubation period of the primary infection, and one may suppose that in the interval between these attacks there arises a progressive multiplication of the few residual parasites, until the quantity necessary for the production of the febrile attack is reached.

And there are other relapses, which come on after a more or less lengthy period of latency, which can be thought to have the same genesis. Indeed, there is nothing to compel us to admit that the residual parasites, which survive the action of quinine, and pass regularly and typically through their life cycle, ought to increase in a progressive manner by their multiplication. As is commonly known, quartan and tertian infections are seen, which, when not treated, go on monotonously for weeks and months without showing exacerbations, even not rarely diminishing in intensity of clinical symptoms, while not only does the number of parasites show no increase, but also may diminish in proportion to the lessening of the clinical symptoms. This may be explained by stating that not all of the young forms resulting from multiplication go on through a regular cycle of development. From these data we may suppose that a minimum quantity of parasites escapes the action of the specific remedy, and these follow their accustomed life cycle, without increasing in number, or perhaps without arriving at the limit of the quantity necessary to give fever until a long time has elapsed. Increase in number, with

rapid and progressive multiplication of the parasites can occur when the patient suffers from some debilitating cause that is the obvious occasion of the return of the fever. If this viewpoint be accepted the genesis of most relapses would be substantially identical with that to which I have just referred. In other words, it may be that in the intervals between relapses the usual forms of the pyrogenous cycle are found in the peripheral blood; or it may be that they cannot be found, yet relapses could always be due to the presence of such residual parasites, which, in the greater number of cases, are too few to be found in the regular examination.

But, although due consideration be granted to the foregoing data, there are yet certain facts for which a satisfactory explanation has not yet been given. Thus it is not easy to understand why, if, in the intervals of apyrexia, quinine is administered every day and in large doses, still, in a certain number of cases, relapses occur. I repeat, this is not easily understood, if it is admitted that in the blood in minimum number there are the same forms that develop during the febrile periods, and that in these it is not possible to demonstrate any biological change, unless we wish to suppose that during the periods of latency the parasites are more resistant to quinine, and further, that during the fever certain modifications occur, by which the parasites may be made more sensible to the action of the drug, which facts certainly cannot be denied *a priori*.

More than once I have administered the sulphate of quinine in doses of a gramme a day, and even in larger doses, to persons who had chronic malaria, and I have seen a relapse occur, with estivo-autumnal parasites in the peripheral blood a few days after the withdrawal of the remedy. On the other hand, I have found out that, in cases of experimental malaria, which were energetically treated after the first access of fever, relapses were reduced to a minimum, and sometimes entirely suppressed. Moreover, it is a matter of common knowledge that the sooner after the manifestation of fever treatment is begun the more easily the physician can control the infection; while infections that have run for some time are more rebellious to treatment.

Nor is it easy to understand, granted that relapses are due to the mechanism to which I have referred above, the relapses due to different species of the parasites. For example, cases are not rare, when, after a series of estivo-autumnal relapses during the autumn and winter and apparently cured, in the spring a relapse of ordinary tertian occurs under circumstances of environment that make it possible to exclude a reinfection with this parasite. Why have the parasites of tertian fever resisted the action of the remedy that has conquered even the estivo-autumnal parasites, if the former occurred in the blood in the well-known forms of the pyrogenic cycle?

These considerations, and others analogous to them, caused me some time ago to formulate an hypothesis that should depend on a morphological basis. According to this some spores (monogenic sporozoites) might be deposited in the internal viscera, where, making a membrane for themselves, they could change into resisting forms and could provide for a continuance of the infection.

It is well known that not all of the parasites that result from sporulation at the beginning of a febrile attack go on through the developmental cycle. In fact, and this is especially demonstrated in quartan infections, if all of the merozoites resulting from multiplication of the parasites should develop regularly the number of parasites in successive attacks would increase in a definite proportion, which is not so. Some of these merozoites and also entire fission forms are deposited in the internal viscera, especially in the spleen and in the bone marrow, where, and this rests the hypothesis, they may be able to convert themselves into resistant forms.

This hypothesis was adopted, in my opinion, to explain not only the facts previously re-

ferred to, but also particularly the fact that relapses are less probable and less numerous in direct proportion to the number of febrile attacks that occurred before the exhibition of a rigorous and methodical quinine treatment.

But inasmuch as more accurate researches undertaken whenever the opportunity offered, especially on the spleen and bone marrow, in cases of chronic malaria, have not given me a positive result; that is to say, such researches have failed to demonstrate the supposed resisting forms as morphologically differentiated, nor have others had better success, it is now my opinion that the said hypothesis ought to be abandoned, at least provisionally,* the more so since it is possible to substitute for it another that has as a basis the support of analogy. I refer to the observations made in the past few years in the school of Ehrlich concerning the behavior of trypanosomes when acted upon by various remedies.

As is known, in the Institute of Frankfort (4), it has been demonstrated that the insuccess of the protracted treatment of trypanosomiasis over a long time, and with various chemical agents, depends upon this fact; that there is formed little by little *varieties* of trypanosomes resistant against the said agents. Thus Ehrlich, with Browning and Rohl, has obtained a strain of trypanosomes resistant against fuchsin and against a series of other toxic substances (tri-phenyl-methane staining substances), a strain resistant against trypan-red and allied substances—trypan-blue and trypan-violet—and finally, a strain resistant against arsanil.

In rats resistance against atoxyl is observed as a rule after a long time, but Ehrlich has had cases in which it could be demonstrated after fourteen days. This observation is of importance, because it gives us a possibility of explaining by this resistance the negative results that occur in the treatment of sleeping sickness, notwithstanding the administration of the remedy for a long while.

Once acquired, this property of resistance can remain unchanged for long periods. Thus, the strain resistant against arsanil (arsanil fast) has been passed 300 times through normal animals, which requires about 700 days, and despite this long time it has preserved intact its resistance; that is to say, the resistance is hereditary.

Ehrlich has carried the strain resistant against atoxyl (atoxyl fast) through more than 125 changes without observing any diminution in its powers of resisting the drug.

Also of importance is the fact that the resistance of these types of strains is specific. So that the strain resistant against fuchsin is not resistant against atoxyl and trypan-red and *vice-versa*. The resistance is lost if chemicals other than those of a particular group are used.

Nor are facts analogous to the preceding lacking.

Thus Franke, in Ehrlich's laboratory, has found that there exists types of strains of parasites resistant against the protective substances formed during the course of an infection.

Levaditi has observed the same fact with regard to the spirilla of relapsing fever.

To the same group of facts belong the observations of Effront, who many years ago succeeded in obtaining protozoa resistant to hydrofluoric acid, and biologically endowed with properties different from those of the normal protozoa; and also he showed that these protozoa preserved through many generations this specific resistance to poison, acquired by adaption.

It is a question, then, according to Ehrlich, of a general law. This is of the greatest im-

*It would be useful to study anew the question, applying to the examination of the blood-making organs of patients with relapsing malaria, who die from intercurrent diseases such as pneumonia, all the new methods introduced in the last few years in histological technique and in the recent study of protozoa. It is noted, in view of the necessity of such study, that I, *apropos* of my old hypothesis, do not express myself as abandoning it decisively. (Author's note.)

portance because of the fact that the acquired modification (resistance or immunity)* results from hereditary properties.

Ehrlich knows of one case communicated by Professor Plimmer, with respect to a strain of trypanosomes from a patient with sleeping sickness, who had been treated for a long time with arsanil, which strain, when experimentally introduced into animals, showed itself very resistant to that substance (arsanil fast).

I shall add this fact, shown by the researches of Morgenroth and Halberstaedter (5), that there is a similar connection between quinine and trypanosomes. These authors, who sought to demonstrate by research if quinine would exercise a prophylactic action in experimental infections with trypanosomes, were of the opinion that they had demonstrated that the drug had such an action (the quinine acted on the trypanosomes by inhibiting their reproductive activity) and they admitted the possibility that, in latent trypanosomiasis, there can be established a kind of habituation of the organisms to quinine, (a certain quinine fast property of the trypanosomes).

I have cited at length the results of the above studies in order to set forth what seems to be justified in the actual state of our present knowledge, a similar hypothesis to explain the obstinate resistance to quinine that is presented in relapsing malaria, especially in the clinical cases of chronic malarial infection.

Such resistance is common knowledge of physicians who practice in malarial communities. And it is on account of this resistance that not seldom patients refuse to continue taking quinine, because they do not feel in a more manifest manner the beneficial effects of the drug. Thus they prefer to have recourse to the patent medicines which inundate the market and find ready believers in their virtues; especially when the name does not indicate clearly the quinine content; so that the thoughtless do not realize that, under a different label, they are continuing to take the valuable alkaloid.*

I have already stated the results of my experience. Not only did the administration of quinine by mouth every day in large doses fail, in some cases, to eliminate subsequent relapse, but the same insuccess can follow energetic treatment by hypodermic injections. Not to limit myself to the citation of my own experiences, I shall record, for example, a case described by Torti and Angelini (6), who in this instance injected hypodermically every day a gramme of quinine for fifteen days; then gave the remedy by mouth for about a month, and, notwithstanding this, observed a relapse. They then gave hypodermic injections for fifteen days more (half a gramme a day), and the day after the suspension of the remedy, they observed fever with the finding of parasites in the peripheral blood.

But it would be useless to cite further individual observations, so well is known the resistance which not rarely cases of chronic malaria offer, whether or not febrile manifestations are shown, to energetic and continued quinine treatment.

I have already noted the facility with which cases of experimental infection from anopheles can be controlled, if, as soon as the fever

*Translator's parenthesis.

Although the authorities mentioned, as occasion has offered, in their experimental researches have obtained strains of maximum resistance, we must not expect, according to Ehrlich, that the same grade of resistance in the course of a drug treatment will be obtained in man as is obtained in animals, for in man strains of medium resistance (half fast) will follow habituation of parasites to a drug; under the action of atoxyl in suitable doses, trypanosomes become scarce, but after a certain time they reappear, whence the difficulty of treating these cases.

The experience that we possess in regard to such cases (those in which such "half fast" parasites have been transferred from man to animals)* is very scanty.

*Translator's parenthesis.

*Evidently the sale of "sure cures" for fever and chills, which are guaranteed not to contain quinine, is not confined to the southern part of the United States. One of these was analyzed some years ago by me. The label stated that it was guaranteed not to contain quinine, but none the less five grains of the drug to the dose was found in the preparation.—W. M. J.

is manifest and the parasites appear in the blood prompt and continued treatment is instituted. From the facts of which I have knowledge although they are not numerous, I am of the impression that infections brought about by injection of malarial blood do not yield so easily. This difference perhaps could depend on the fact that in this latter instance the injected parasites were already habituated in the first human host to the action of quinine, to which, in the schizont stage, they had already become resistant.

All these data can be interpreted by the hypothesis that I shall propose as most in conformity with our actual knowledge. Thus, I admit that certain malarial parasites under the action of quinine, in some cases, are selected to form resistant strains, whence the difficulty of a radical cure in such fevers that relapse obstinately. It is not possible to say certainly, with any approximation, to what extent this can be verified. But resistant cases, although rare, are evidently those which should be most considered in regard to prophylactic measures, because it is these which are largely responsible for the persistance of infection and its continued spread by such cases that are able to be up and around.

There are also facts which cause me to think that there may be some strains of parasites endowed orginally with great resistance to quinine. For example, several times Marchiafava and I have seen at autopsy cases of pernicious malaria very rich indeed in parasites accumulated in the vessels of the central nervous system, the spleen, the liver, the bone marrow, etc., in spite of an energetic quinine treatment for more than two days. Since these were recent infections, in these cases it does not seem admissable that the resistant strain, so to speak, was selected in consequence of the use of the alkaloid. With these may be contrasted those pernicious cases in which the quinine used in large amounts brings about the complete destruction of the parasites; notwithstanding which death supervenes, seemingly in consequence of alterations in the viscera secondary to the parasitic invasion, and at autopsy no parasites are found, or perhaps a few forms after accurate examination (7).

The conclusion that follows from all this has not to do, certainly, with confidence in the efficacy of quinine treatment, as every one knows that by persistence in proper treatment the infection can be conquered; but it concerns the treatment of malarial patients as rapidly as possible, intensifying our efforts at the beginning of the malady, inasmuch as a complete and rapid cure is the more probable in proportion to the promptness of the administration of the remedy.*

And it is almost useless to add that the formation of strains resistant or semi-resistant (half fast) to quinine is a matter that does not admit of experimental proof, such as has been shown with trypanosomes. Human malaria not being transmissible to animals, it would be necessary to inoculate a healthy person with the blood from a resistant and relapsing case, in order to see if the same biological properties of the parasites would be recognizable in the inoculated person. But for obvious reasons, this is not practicable, nor is the solidity of the hypothesis affected thereby, so many are the observations that sustain it.

It seems to me possible to infer in due course concerning the genesis of relapses:

1. That the data presented hitherto do not permit, as far as our present knowledge is of avail, that the reports of relapses due to persistence of the macrogametes are parthenogenetic multiplication of these can be affirmed with certainty.

2. That in all probability relapses, whether at short or long intervals, or whether separated by lengthy periods of latency, should be considered from a single viewpoint: that is to say, as having the same genesis, depending on the persistence of the pyrogenous cycle.

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*Naturally one can come to practically the same conclusion, if one admits that the genesis of relapses is due to parthenogenesis of the macrogametes. Indeed, the peculiar resistance of these forms to the action of quinine is common knowledge. (Author's note.)

In one group of relpases the parasitic material that maintains the infection is represented by a minimum quantity of forms of the ordinary fever producing cycle, often recognizable by an accurate microscopical examination, at least at some time in the course of the infection, which forms for a long time cannot attain the quantity or the virulence necessary to cause fever. Especially in those cases in which a series of relapses occur at longer or shorter intervals without quinine treatment, one should keep in mind the possibility that after a series of febrile attacks the organism acquires a certain immunity in respect to the pyrogenic action of the parasites: which immunity being transitory, as happens in other infections, it is attenuated or ceases after a certain period of apyrexia; whence the onset of relapse.

But there is also a group of relapses, in which the material that maintains the infection during the period of latency, is represented by forms resistant to quinine, due to a process of selection under the action of the alkaloid, as occasion offers; it is not necessary to suppose that such forms differ morphologically from others as I, myself, more than once,* have also thought.

Such modifications in the biological properties of the parasites are admitted by me, on account of the difficulty that is encountered in trying to explain all the facts regarding relapses, and especially the inefficacy of quinine treatment during long periods of latency accompanied by perfect health, and also the relation that exists on the one hand between the frequency and the obstinacy of relapses, and the number of febrile attacks that occur without cure or with only an incomplete therapeutic success on the other.

If the facts that I have demonstrated are admitted, so that it is conceded that occasionally there occur strains truly resistant to quinine, it is reasonable to think that similarly there are found with a certain frequency in chronic cases of malaria strains of parasites endowed with a medium resistance against the alkaloid, analogous to what Ehrlich believes to happen with the trypanosomes in sleeping sickness in respect to arsenical preparations; and though in such malarial cases treatment not sufficiently energetic and protracted will bring about a practical absence of parasites from the blood, it will not avoid a return of the fever and parasites after a longer or shorter time.

*I was formerly of the opinion that all forms of the parasites, except, of course, the gametes, were equally affected by the action of quinine when the drug was properly administered, and so expressed myself in a paper on quartan malaria. But since reading Dr. Bignami's article, I have made a more careful study, using quinine in varying doses, and I can confirm Dr. Bignami's statement, that there are forms of the ordinary asexual cycle that are resistant to quinine, and do not differ morphologically from the normal asexual parasites. If quinine be given, say in tertian infections, in doses of three grains three times a day, many of the parasites can be observed undergoing the changes accurately described by Captain C. F. Craig as occurring under the influence of the drug, but many more do not show such changes. In proportion as the dosage is increased, fewer normal parasites are found, but prolonged search will nearly always reveal such normal parasites, and these, as long as they escape the action of quinine, certainly could renew the infection, as Dr. Bignami believes.—W. M. J.

Note.—The construction of sentences in Italian differs so markedly from English composition that in many instances it has been necessary to recast entire paragraphs. I have, however, tried to follow as faithfully as possible the style and expression of Dr. Bignami, and any lack of clearness or fault of rhetoric should be attributed to the shortcomings of the translator, and not to the author, whose paper in the original is a model of clearness and good style.—W. M. J.

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Volume of the Twentieth Century Practice of Medicine, New York, William Wood & Co. I earnestly recommend anyone interested in the study of malaria to consult this volume before advancing any personal observations. I speak from personal experience.—W. M. J.)

NITROUS-OXIDE OXYGEN ANAESTHESIA.

By E. M. PRINCE, M.D.,
Birmingham, Ala.

Having operated upon two thousand five hundred cases, most of them major surgical operations, under gas-oxygen anaesthesia, I feel I know something of this anaesthetic, although I fully appreciate the fact that this number is far too few from which one may draw any valuable conclusions.

A few of the very common opinions have been: (a) that this anaesthetic cannot be given in cases where there is a cardiac lesion; (b) that there must be rebreathing of the gases; (c) that the pulse rate is very materially increased.

In our surgical work for the past year nothing has been used except nitrous oxide-oxygen anaesthesia. When we say nitrous oxide-oxygen we do not mean this was the principal anaesthetic agent in use during the operation and that a "little ether" was necessary, but mean there was not one drop of ether used during the entire operation; therefore, in unselected cases we of necessity had quite a number who showed cardiac lesions of aortic and mitral variety. In these cases we did not hesitate to use nitrous oxide-oxygen anaesthesia.

Before using this anaesthetic in cases who presented cardiac complications we observed the blood pressure in 50 (fifty) cases and found there was no rise. This being the only objection advanced by those who are opposed to the use of nitrous oxide-oxygen in heart lesions we felt we were justified in using it. If we give nitrous oxide gas there is a very sharp rise in the blood pressure, but if plenty of oxygen is given from the beginning there is no appreciable rise and the patients take it with much more ease than they would ether. In several cases I have seen it administered in aortic regurgitation where the blood pressure was above 220, ("cardiac" blood pressure instrument used).

As to rebreathing, from an economic standpoint this is an ideal thing. From the standpoint of the welfare of the patient it is all wrong. The only argument presented by the advocates of rebreathing is economy, and the beneficial effects of CO_2 in cases who do not breathe well on the table. One very eminent authority on gas oxygen anaesthesia in a recent article says, that without rebreathing, gas-oxygen anaesthesia is impossible on account of the great expense. This we have not found to be the case and we have used it in 2,500 cases and the machine used by us cannot be so arranged as to render rebreathing possible. Cheapness should never be taken into consideration when the life of a human being is at stake. If cheapness is the thing desired use chloroform or ether; they are much cheaper. If rebreathing is the thing that some of our enthusiastic advocates would have us believe, then our physiologists of the past are all wrong, and our mode of constructing buildings should be rearranged, for fresh air and ventilation have been the one thought where the construction of a public building has been properly thought out.

The CO_2 is the thing desired and not the other waste products of expiration. This is a very simple matter to obtain by having a fresh tank of CO_2 connected with the machine. If we need CO_2 for a failure in respiration we need it at once and it is better to give a few breaths containing a high percentage of CO_2 than to permit the patient to again breathe the poisonous expired air, which only contains 4 per cent of the substance desired unless he continue to rebreathe into the bag, in which case it will become more poisonous and more concentrated with CO_2; but if he is going to continue to breathe you will perhaps need no stimulation for the respiration. If we need a heart stimulant we do not use nux

OPERATIONS

Performed under Gas & Oxygen Anaesthetic during April, 1912.

No	NAME	SEX	AGE	CHEST	URINE	BLOOD	PULSE BEFORE OPERATION	PULSE AFTER OPERATION	OPERATION	TIME MINUTES	DRAINED	RECOVERY
1	J.R.	M.	42	Neg.	Albumen and Hyaline Casts	W.B.C. 11000 Hemo 90	124	120	Appendectomy	23	No	Yes
2	P.P.	F.	31	Neg.	Neg.	W.B.C. 11000 Hemo 90	68	80	Curettage	7		Yes
3	C.N	M.	67	Asthmatic	Albumen	W.B.C. 11000 Hemo 85	120	106	Hematoma of Spleen	8	Yes	Yes
4	J.E.	F.	25	Neg.	Neg.	W.B.C. 10000 Hemo 85	120	120	Curettage	6		Yes
5	S.W.	F.	28	Neg.	Albumen	W.B.C. 15000 Hemo 85	112	112	Appendectomy	17	No.	Yes
6	W.C.	F.	26	Neg.	Neg.	W.B.C. 14000 Hemo 85	120	110	Infected Uterus	12	No	Yes
7	M.H	F.	18	Neg.	Neg.	W.B.C. 13000 Hemo 90	104	116	Appendectomy	14	No	Yes
8	F.K.	F.	23	T.B.	Albumen	W.B.C. 18000 Hemo 90	140	160	Appendectomy & Salpingectomy	30	Yes	Yes
9	A B	M.	26	Empyema	Albumen	W.B.C. 18500	108	112	Resected Rib	5	Yes	Yes
10	E.E.	M.	25	Neg.	Neg.	W.B.C. 20000 Hemo 70	130	144	Osteomyelitis Tibia	15	Yes	Yes
11	W.L.	M.	22	Neg.	Alb. & Hyaline & Granular Casts	W.B.C. 21000 Hemo 90	98	128	Appendectomy	16½	Yes	Yes
12	M.M.	F.	26	Neg.	Neg.	W.B.C. 9000 Hemo 90	104	112	Salpingectomy & Appendectomy	38	Yes	Yes
13	R.N	M.	12	Neg.	Neg.	W.B.C. 32000	136	140	Appendectomy	8½	Yes	Yes
14	H.F.	F.	45	Tubercular	Albumen	W.B.C. 9000 Hemo 70	92	120	Laparotomy	8	Yes	Yes
15	J.O.	F.	22	Neg.	Neg.	W.B.C. 7000	120	196	Trachelorrhaphy	6		Yes
16	M.S.	F.	22	Neg.	Neg.	W.B.C. 11000 Hemo 90	108	116	Appendectomy	11	No	Yes
17	R.A.	F.	39	Neg	Neg.	W.B.C. 9000 Hemo 75	120	110	Hysterectomy & Appendectomy	56	Yes	Yes
18	M.L.	F.	24	Neg.	Albumen & Hyaline Casts	W.B.C. 14500 Hemo 80	118	108	Hysterectomy	36	Yes	Yes
19	L.S.	F.	9	Neg.	Neg.	—	120	94	Abscess of Neck	3	Yes	Yes
20	H.P.	F.	34	Neg.	Albumen	W.B.C. 7500 Hemo 70	96	112	Hysterectomy	27	Yes	Yes
21	N.A.	F.	28	Neg.	Neg.	W.B.C. 6000 Hemo 70	108	94	Hysterectomy Appendectomy	39	No	Yes
22	W.P.	M.	8	Neg.	Neg.	W.B.C. 21500 Hemo 90	110	120	Palmar Abscess	3	Yes	Yes
23	H.B.	M.	10	Neg.	Alb. & Hyaline Gran Casts.	W.B.C 5000 Hemo 85	112	90	Osteomyelitis Of Tibia	12	Yes	Yes
24	W.S.	M.	21	Neg.	Albumen	W.B.C. 5000 Hemo 85	100	124	Appendectomy	13½	Yes	Yes
25	T.T.	M.	4	Neg.	Neg	—	114	120	Accident Case	14	Yes	Yes
26	L.H.	F.	43	Neg.	Neg.	W.B.C. 12000 Hemo 85	96	84	Hysterectomy	32	Yes	Yes
27	R.H.	M.	38	Mitral Reg.	Neg.	—	76	120	Inguinal Adenectomy	5	Yes	Yes
28	D.P.	F.	43	Neg.	Albumen	W.B.C. 7000 Hemo 35	124	112	Pan Hysterectomy	39	Yes	Yes
29	L.S.	M.	7	Empyema	Neg.	W.B.C. 22500 Hemo 70	80	112	Resected Rib	5	Yes	Yes
30	M.B.	F.	31	Neg.	Neg.	W.B.C. 11500 Hemo 85	104	104	Appendectomy & Salpingectomy	32½	Yes	Yes
31	S.M.	F.	40	Neg.	Neg.	—	122	120	Hemorrhoids	7		Yes
32	A.O.	F.	44	Neg.	Neg	W.B.C. 7000 Hemo 30	124	124	Pan Hysterectomy	52	Yes	Yes
33	B.C.	M.	31	Neg.	Neg	—	92	108	Gun Shot of Shoulder	8	Yes	Yes

34	J B	F.	32	Neg.	Neg.	W.B.C. 9000 Hemo 80	156	140	Hysterectomy	50	Yes	Yes
35	J.K.	M.	47	Neg.	Neg.	—	72	72	Orchidectomy	5	No	Yes
36	C.P.	F.	20	Aortic Stenosis	Neg.	W.B.C. 8000 Hemo 60	116	140	Hemorrhoids	7	No	Yes
37	W.J.	M.	44	Neg.	Albumen	W.B.C. 5400 Hemo 65	112	120	Hemorrhoids	8	No	Yes
38	M.H.	M.	34	Neg.	Neg.	—	100	122	Circumcision	6	No	Yes
39	R.T.	F	32	Neg.	Albumen	W.B.C. 14000 Hemo 90	112	120	Cholycystotomy & Appendectomy	50	Yes	Yes
40	E.J.	F	17	Neg	Neg.	—	124	120	Hemorrhoids	5	No	Yes
41	J H	F	35	Neg.	Neg.	W.B.C 13000 Hemo 75	140	140	Appendectomy & Salpingectomy	20	Yes	Yes
42	D S	M.	23	Neg.	Neg.	W.B.C. 12500	104	108	Appendectomy	29½	No	Yes
43	J C	M	24	Neg	Neg	W B C 9000	116	96	Appendectomy	16	No	Yes
44	G B	F	18	Neg.	Neg.	—	112	100	Sutured Tenden	8	No	Yes
45	W H	M	48	Neg.	Albumen & H&E Casts	W.B.C 13000 Hemo 50	108	120	Cholycystotomy	28½	Yes	Yes
46	A D	F	18	Neg	Albumen	W.B.C 9500 Hemo 90	140	160	Appendectomy	15	Yes	Yes
47	M.W	F.	54	Neg.	Albumen	W.B.C. 13000 Hemo 80	132	96	Infected Ovarian Cyst	21	Yes	No
48	W P	F.	30	Neg	Neg.	W.B.C. 13000 Hemo 70	128	133	Salpingectomy & Appendectomy	25	No	Yes
49	M.C.	F.	51	Neg.	Neg.	—	110	112	Hemorrhoids	5	No	Yes
50	T.C.	F.	53	Neg.	Neg	W.B.C 9000 Hemo 65	108	140	Drained Abdominal Abscess	11	Yes	Yes
51	M O	F	26	Neg.	Neg.	W.B.C 9000 Hemo 70	88	82	Salpingectomy	26	Yes	Yes
52	F.B.	F.	33	Neg.	Neg.	Hemo 60	144	132	Hemorrhoids	4	No	Yes
53	A.O.	M.	28	Neg.	—	—	100	92	Incised Wound	5	No	Yes
54	J.G.	F.	33	Neg.	Albumen	W.B.C 11500 Hemo 80	120	144	Ruptured Ectopic	15	Yes	Yes
55	C.D.	M.	39	Neg.	Neg.	W.B.C. 7000 Hemo 90	100	72	Hernictomy	18	No	Yes
56	M.D.	F.	32	Neg.	Neg.	W.B.C. 7000 Hemo 95	120	116	Appendectomy & Salpingectomy	24	No	Yes
57	T.H.	M.	33	Neg.	Neg.	—	100	100	Scalp wound & Fracture of Clavicle	7	No	Yes
58	L.M.	F.	19	Neg.	Neg.	W.B.C. 16000	120	112	Appendectomy	11½	No	Yes
59	S.J.	F.	21	Neg.	Neg.	—	72	116	Non Malig Tumor of Breast	19	No	Yes
60	J.J.	M.	18	Neg.	Albumen	W.B.C. 14000 Hemo 85	160	152	Amp. Thigh	10	No	Yes
61	S.D.	F.	32	Neg.	Neg.	W.B.C. 7000 Hemo 85	100	124	Herniotomy	34	No	Yes
62	W.L.	F.	20	Neg.	Neg.	W.B.C. 8000 Hemo 80	156	106	Appendectomy & Salpingectomy	21	No	Yes
63	J.M	F.	30	Neg.	Neg.	W.B.C. 16000 Hemo 90	144	124	Appendectomy	11	Yes	Yes
64	D.S.	M.	29	Neg.	Albumen & H.&E. Casts	W.B.C. 9800 Hemo 95	100	116	Gun Shot of Liver	29	Yes	Yes
65	R.J.	M.	74	Neg.	Albumen	W.B.C. 14000 Hemo 60	115	120	Amp. of Thumb	10	No	Yes
66	E.R.	F.	14	Neg.	Albumen	W.B.C. 14000 Hemo 60	158	140	Drained App. Abscess	3	Yes	Yes
67	G.L.	M.	23	Neg.	Neg.	W.B.C. 21000 Hemo 85	88	120	Herniotomy & Appendectomy	34	No	Yes
68	L.B.	F.	39	Neg.	Neg.	W.B.C. 9000 Hemo 50	140	140	Hysterectomy	39	Yes	Yes
69	C.D.	F.	26	Neg.	Neg.	W.B.C. 10000 Hemo 100	66	72	Herniotomy	17	No	Yes

vomica because it contains the alkaloid strychnine; we give the strychnine. The same should apply as to the CO_2. This is manufactured by the same companies who manufacture the other gases, in tanks which may be connected with the machine.

If rebreathing is not harmful it is at least dangerous, and I do not think any advocate of rebreathing would enjoy breathing from the same bag a tubercular patient had just used before him. There is no sure method of sterilization except heat, and this is impossible to apply to the bags I have seen. One might suggest to destroy the bags after a tubercular patient, but we often are not sure when we are operating on a case in which an early tubercular process is present. We might destroy them all, but we would then tear down the idol of rebreathing—cheapness.

CO_2 is unnecessary except in the occasional case. About one in one hundred need a respiratory stimulant; when they do we have the pure, uncontaminated CO_2 at our command. Teter says that CO_2 is slightly increased over normal in the blood under gas-oxygen anaesthesia. (Surgical Clinics of John B. Murphy, vol. 1, No. 1, page 71).

The pulse rate is not increased in this anaesthesia if plenty of oxygen is used. The pulse rate shown in chart is taken from record made by Dr. Dawson while the patient was on the table. The variation shown would not be in excess of that under ether.

Large robust men are said to be unfit subjects for gas-oxygen anaesthesia, but this has not been our experience. There were four large subjects during the month of April, each weighing more than 200, one whose weight was 268, and each took the anaesthetic much more kindly than they would have taken ether. During the month of January, repeated in Journal Am. Med. Asso. of May 4, 1912, there were five subjects whose weight exceeded an average of 225 pounds.

The variety of operations on the chart show there are no contraindications as to the kind of operations. The majority of cases were drained, which means we had a large per cent of pus cases. The results show only one death, a mortality of a little over one per cent, which, considering the class of cases, we would consider very good. This low mortality is due in part to the anaesthetic used.

The mortality from this anaesthetic is indeed very low, although you find reports of deaths which would do an injustice to this anaesthetic, unless one would take the time to analzye the cause of death. Dr. Allen, in the Journal of the American Medical Association, February 10, 1912, attributes the death of a man who was almost dying when the anaesthetic was begun, to the anaesthetic. He says "the patient was a profoundly uraemic, almost pulseless man,"—this before the anaesthetic began. Certainly one would not expect a patient of this kind to do well under any anaesthetic, and if he should die while it was being administered, one would not be greatly surprised.

Dr. Gwathmey, in the Journal of the American Medical Association, of February 17, 1912, page 466, refers to the first death under nitrous oxide-oxygen anaesthesia, which was reported by Dr. Lydston, in the Medical Record of November 12, 1910, and which was later said by him and his anaesthetist not to be a nitrous oxide-oxygen anaesthesia, as he thought it was at the time of his first report. He afterward corrected this report in the Medical Record of February 11, 1911.

The most essential factor in the mortality is to have a well-trained, capable anaesthetist who has given a sufficient number of gas-oxygen anaesthesias to be thoroughly familiar with the work. It should never be intrusted to the interne. The expert anaesthetist should be paid as all other specialists are paid and should not be expected to perform the function of an expert anaesthetist for a very small consideration. If this work was properly appreciated by the surgeons, more capable physicians would specialize in this branch of medicine.

The very dark skinned race, or negro, pre-

sents one of the most difficult class of cases to administer nitrous oxide-oxygen anaesthesia. One of the principal signals for more oxygen is the dusky countenance which can be observed in these cases. The drinker and morphine habitue also at times are extremely hard to get thoroughly relaxed, but plenty of time will usually solve the problem in these cases.

Preliminary medication of morphine grs.1-4, atropine grs. 1-100, strychnine grs. 1-30, are given three-quarters of an hour before operation, if time will permit, and there are no contraindications. In children camphorated tincture of opium is used one hour before the administration of the anaesthetic, and can be continued afterward, as there is seldom any vomiting following the anaesthetic.

In drinkers and morphine habitues the addition of 1-200 grs. scopolamine to the preliminary is ofttimes useful.

The apparatus used is the Cunningham, which has proven to be very satisfactory. Any apparatus with which the gases can be given in definite proportion will prove satisfactory. The only change one would suggest on the Cunningham machine would be to eliminate the ether chamber so that it would be impossible to give a gas-oxygen anaesthesia with "just a little ether."

The use of the ether with gas-oxygen has done the latter a great injustice, as the patients are often told they are getting a gas-oxygen anaesthetic when they receive "just a little ether—"enough to cause much nausea or vomiting, and ofttimes other very unpleasant after effects. That there are no post-operative complications due to a pure gas-oxygen anaesthesia has been proven by very extensive observations by Crile and others. That there are no harmful effects on the lungs, heart, brain, blood, kidneys or other organs of the body, which eliminates from surgery some of the dangerous elements which are not infrequently encountered after other anaesthetics.

The greater number of my anaesthetics have been administered by Dr. Jas. R. Dawson, who has made quite a study of this anaesthetic, and whose superior as a gas-oxygen anaesthetist would be hard to find.

NITROUS OXIDE AND OXYGEN ANESTHESIA.

By T. O. BURGER, M.D., and
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With the present improved operative technique and low mortality, the laity are not so much concerned about the surgery proper as with the being "put to sleep" and the awful sickness following. It is due them the saving of this if possible, and it is within our power to prevent this unpleasantness, both during and following the administration of anesthetics by the use of nitrous oxide and oxygen.

Nitrous oxide and oxygen have unquestionably been proven to be the quickest, safest, most pleasant to take, and of least injury to the patient in after-effects of any known anesthetic.

Nitrous oxide was first administered as an anesthetic by Horace Wells, a dentist of Hartford, Conn., in 1844, and has been used intermittently since, dentists making use of it more frequently than physicians. Therefore to the dentist we owe more of its perfected technique in administration. To Dr. Crile and the dentist, Dr. Teter, of Cleveland, O., must be given the credit for the prominent place nitrous oxide and oxygen have taken as an anesthetic.

A number of surgeons have made use of it for varying periods of time, and abandoned its use, giving as their reason a number of little hindrances, such as the cumbersomeness of the apparatus for giving, the necessity of a specially trained anesthetist, the cost of the apparatus and cost of gas, and also the fact that a few patients will not take it well, or will not become sufficiently relaxed for some surgical procedures. Another reason— and, to be sure, a good one—is the tendency of surgeons to simplify operative procedures as much as possible. It is a fact that

the proper giving of gas involves considerable ceremony or formalities.

Ether is the choice of many of the best surgeons of today, and is a relatively safe and easily administered anesthetic, therefore the one to always be chosen, unless all the requirements for a gas administration are at hand. Ether, given, as it is in the larger clinics, by specially trained members of the staff, is used with a very low mortality, but universally with more or less post-anesthetic objections.

ESSENTIALS TO A PROPERLY GIVEN NITROUS OXIDE AND OXYGEN ANESTHESIA.

First—In the giving of any anesthesia an air of confidence is of inestimable worth, and it is certainly very much easier obtained if the patient knows that only gas is to be administered. This confidence not only makes the patient much more easily anesthetized, but lessens the fear, and, as Crile has well shown, eliminates a great deal of actual injury to the brain and nervous system, thus saving the patient much of the nervousness following the operation.

Second—An anesthetist who is thoroughly familiar with the apparatus, the action of the agents used, and one who is interested in this anesthetic.

Third—An improved or modern apparatus with all the attachments, especially the large cylinders and pressure gauges, that a steady, continuous flow of both gas and oxygen may be obtained.

Fourth—The giving of morphine and atropine about thirty minutes before the beginning of anesthesia. Scopolamine may also be used to calm an unusually nervous patient.

In our work we have used the Teter apparatus, with all the accessories, in all major surgery, and have found it entirely satisfactory in every instance, though occasionally we do use some ether through the attachment provided for that purpose. However, in a number of the more prolonged laparotomies we never resort to the ether at all. If ether is used in this way, we do not get the unpleasant ether nausea and kidney irritation, as when straight ether is used throughout. The warming of the gases for inhalation is obviously of great advantage to the patient, requiring a less amount and less danger of pneumonia or respiratory irritation.

DISADVANTAGES OF OR OBJECTIONS TO THE USE OF NITROUS OXIDE AND OXYGEN.

First—It requires a rather expensive and cumbersome outfit.

Second—Requires a more expert, attentive and specially trained anesthetist.

Third—Is more expensive, costing from $3 to $6 per hour for gas, unless considerable rebreathing is resorted to, which, however, is very desirable in some instances.

Fourth—An occasional failure to get thorough relaxation, and a few idiosyncrasies. One of our cases, an asthmatic, would not go under it until ether was used to get thorough relaxation, after which a difficult hysterectomy was performed with perfect relaxation, using only nitrous oxide and oxygen. Children with obstructed nasal respiration from adenoids have not taken it kindly.

Fifth—It is not the anesthetic of choice unless a trained anesthetist gives it.

ADVANTAGES OVER OTHER ANESTHETICS.

It is unquestionably the safest known anesthetic, if all the requirements are fulfilled, as before stated under essentials.

It is certainly more pleasant to take, as it is free from the excitement on "going under" and in "coming out."

The post-operative nausea and vomiting that it frees the patient from alone, if all other things were equal, should decide in favor of this anesthetic. However, a few will vomit after the operation from the manipulation, the psychic effect, the morphine, and a few from the gas, but this is very infrequent.

Shock is not produced as with ether or chloroform, and Crile states that patients will endure four times more trauma under gas than under ether.

The effect on the blood, as has been shown, is very greatly in favor of this over any other anesthetic, chloroform producing much more destruction to the blood cells and phagocytes, ether next, and gas least, if any at all. That patients are able to withstand more infection and recover more promptly and perfectly after gas than after ether has been demonstrated by scientific observers.

When given with plenty of oxygen, patients may be kept under it longer and recover from it more surely than with ether, even though this is supposed to be an anesthetic for short procedures only. It has been our observation in our own use and at the larger clinics that after a period of ten minutes' administration patients take it more perfectly and it is much more easily controlled.

As before stated, some of the leading surgeons today are using ether as a routine after having tried gas for a while, and the hindrances enumerated are, to our minds, small as compared with the safety and especially the comfort of our patients. We have mentioned Crile more than once. All of us, we think, admit that he has done more for the comfort of the patient than any other living surgeon. However, as he states, it requires much more of the surgeon's energy and time. Crile also shows as low mortality as is seen in any clinics.

Ether given by a trained anesthetist, as is seen at the Mayo's or a Bevan's clinic, is very fascinating, especially after having seen it given by internes or the untrained. Yet the patient is sure to have the post-anesthetic nausea and vomiting, the certain amount of kidney sequelae and more neurasthenia than we have when gas is given. A patient who has once taken ether and remembers the unpleasantness is always a welcome recipient of gas if another operation is to be undergone.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.*

By A. E. THAYER, M.D.,

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The object of this paper is to present some of the personal observations on epidemic meningitis made during the Dallas epidemic, from January to May, 1912, inclusive. The material studied, besides some clinical experiences, includes:

Spinal fluids	2,130
Nose and throat swabs	1,716
Urines from patients	48
Blood smears	35
Widal reactions	31
Sputa	4
Fluid from herpes	11
Exudates from eye and ear	10
Blood cultures	1
Total examinations of all kinds	3,986

In the first place, I should like to say a few words as to the nature of the disease. No writer in either the American or the foreign literature, so far as I know, has expressed the view that the disease is a bacteremia, probably from the first, and probably in every case. That is one of the new views derived from the study of the cases in the Dallas epidemic, for quite early the conviction forced itself upon me that the early involvement of deep-seated tissues like those of the joints and the labyrinth, the hemorrhages in the skin, the presence of meningococci in the herpes vesicles, their recovery in pure culture five hours after death not only from the substance of the brain, but from the heart blood, the spleen pulp and the kidney tissue as well, the excretion of the meningococci in the urine before death, from which material I was the first to recover them alive and cultivate them, all are elements in the infection which lead to the conclusion that it is a bacteremia, probably from the first in all cases; and the patient may have the worst effect of the systemic infection in other organs than those of the central nervous system. The

*Read before the Mobile County Medical Society, January 11, 1913.

usual stages of the infective process are, the development in the nose and pharynx, often in enormous numbers, of the meningococci; coryza and pharyngitis, which may be slight or purulent, and in the excessive mucus produced locally the cocci appear to find a suitable medium for development; then the beginning of absorption of toxins, alone or chiefly, all of which may last so short a time as to be overlooked; and then, when the general resistance has been lowered by this systemic poisoning, a general bacteremia with, in the majority of cases, a localization in the cerebro-spinal axis as well. If this view is correct, as I am inclined to believe, it is of the greatest importance for the treatment of the cases, as will be suggested later. The path of entry into the cerebro-spinal cavity is probably along the lymph passages which connect it with the upper respiratory tract, and, through the beginning of the same lymphatics and their cervical connections, the way is quite as open to general infection of the blood current. It is possible that the systemic infection may come later, after the spinal lesions are well developed, but the probability of absorption of anything from the spinal canal, after it is once the seat of a copious exudate, is not very great.

The sources of infection are mainly three, in my opinion. One, who is a carrier—that is, who has the live meningococci in his upper air passages—may spit them out in one part of the town; they may be inhaled when dry, and taken by the recipient to another part of the town, where he develops the disease a few or many days later; and there is of course no traceable relation between him and the donor. As a rule the coccus of this disease does not withstand drying, but there are strains of it with both resistant and toxin-making powers beyond the average, and this way of infection can not be denied. Far more common, and for the public health work far more important, is the direct transmission to the one who bends over the patient, against whose face he talks and coughs and sneezes, and who shakes out his handkerchiefs and bed linen; those who come within the danger zone of three feet from the patient are almost certain to become carriers, and, if conditions are favorable, may pass on to become patients. A third source of danger is from contact with lower animals, especially the larger draught animals of the farm. Quite a year before the Dallas outbreak there were two animals on a farm three miles south of the city which died of blind staggers; at about the same time, or a little later, three of the children of the family became ill; two died and the third, when brought to the hospital in Dallas, was recognized as a case of cerebro-spinal meningitis. All through Northern Texas and Oklahoma before the epidemic declared itself there were frequent deaths of horses, mules and cows from blind staggers; the same is true of the territory to the north of us now where epidemic meningitis is breaking out. Furthermore, in the spinal fluids from animals which I was able to obtain in Texas there was a diplococcus which in morphology, staining and cultural characters resembled the meningococcus of human cases. I have made arrangements with the city health officer to procure spinal fluid from animals so affected in Northern Alabama, and shall endeavor to find what relationship there may be between the animal and human diseases; but their constant occurrence together, the animal outbreak preceding the human, is very significant. If such a relation could be established it would prove of great hygienic importance. But of these three modes of infection, at least in the height of the epidemic, I feel sure that what Flugge has proved for the patient with tuberculosis of the lungs, namely, that even speaking scatters microscopic droplets which may contain the germ for an average distance of three feet from the patient, is true, and all important for the spread of this form of meningitis. But for the average low resistance of the cocci there would be many more than "one case to a house," which seems

to be the rule of this infection, though a rule often broken in the Dallas epidemic.

At this point I may introduce the methods and results of the study of swabs from the noses and throats of those who had come into contact with patients and from hospital patients; 1,716 individuals were examined by these methods, the carriers through the town for quarantine and prophylaxis, the hospital patients as a condition of their discharge after the disease had subsided.

Of the carriers, 856 examinations were made, but since each examination included two swabs, two smears, and often four cultures, the figures give an inadequate idea of the work involved. For the purpose of gathering the material six students who had had training in bacteriology were each equipped with an ordinary hand satchel, in which the following articles were carried:

1 Dozen slides.
2 Dozen sterile cotton swabs in tubes.
1 Flask of alcohol.
1 Alcohol lamp.
1 Flask of sheep-serum-glucose broth.
1 Dozen Petri dishes containing sheep-serum agar.
2 Dozen cards for personal data.
1 Blue wax pencil.
1 Note book.
1 List of directions.

They were advised to pursue a uniform method and not to omit any one of a family who had come within the danger zone of three feet from the patient, proceeding as follows:

a. Swab the throat.
b. Stroke half the plate.
c. Swab the nose.
d. Stroke the other half and label.
e. Make a smear on a slide from each swab, that from the nose above, from the mouth below, and write the number on the bottom of the slide.
f. Put the swabs back into the tubes and add 1 c. c. of broth to each.
g. Fill out the card and note whether spray or other medication has been used.

By this method each student brought to the laboratory, for each case visited, a smear from the nose, one from the throat, a broth culture and an agar culture from each, and a card with all the important data. The smears were stained with Loffler's methylene blue as a routine and it was noted on the proper card whether the nose or the throat or both were positive; the cultures were incubated till next morning and the results of their examination noted on the back of the card, a Gram's stain being done for completeness if meningococci were found. It soon was proved to my entire satisfaction that a man can train his eye to recognize the meningococcus in the smears on the slides, even though pus cocci and the diplococcus catarrhalis are also present; the pus cocci are not hard to differentiate, but the catarrhalis gives a little trouble at first, though the assertion of several writers upon the point, that it can not be distinguished from the meningococcus microscopically, is erroneous. The diplococcus catarrhalis differs from the meningococcus in being of an average larger size, in taking a deeper stain with the same technic (Loffler's, gently heated to steaming), and in having a different shape; that is, measured from the broad, flat side, the dome of the catarrhalis is lower in proportion to the base while the meningococcus is narrower and higher; these three points serve to distinguish the meningococcus, its lighter stain, its smaller average size, and its height in proportion to its breadth. I would not advise the inexperienced man to trust to morphology alone in this case, or in any other, but, after he has learned to distinguish the meningococci morphologically, and has verified his observations often enough by Gram's stain and the appearances on solid culture media, and the behavior with different sugars, and found that the characteristics of the meningococcus converge upon the organisms which he has learned to recognize, he is then safe in doing as I did, namely, reducing the different steps in the technic of gathering material from quarantined cases, which permits those occupied with this duty to spend less time in each house, and so to cover a larger territory daily, which for public health purposes is important.

Results of the Nose and Throat Work.—Separating the hospital cases from those examined in the city generally, there were of the latter:

Total	Positive.	Negative.	Per Cent Pos.
552	257	295	46.55

That is, on the first examination of smears and cultures from these cases in the city generally the meningococci were found in the throat or the nose or both in 46.5 per cent of all cases, and the findings were verified by the cultures. But it must be noted here that after January 25, for political considerations, the control of the quarantine squad was taken out of my hands, and the figures obtained up to that time are even better, giving 59.61 per cent of positive findings, of which the significance will be pointed out later.

The second examinations, made at intervals of five to seven days, during which time the carrier was supposed to use an antiseptic spray in the nose and throat, gave:

Total.	Positive.	Negative.	Per Cent Pos.
239	85	154	35.56
54	17	37	31.48

The hospital cases were examined either just before or just after their entrance and at intervals after convalescence to see when the upper air passages were free of meningococci. The figures follow:

	Total.	Positive, Nose or Throat.	Negative, Both.
First	379	207	172
Second	277	111	166
Third	64	21	43
Fourth	8	2	2
Fifth	2	0	2
Sixth	10	5	5

Taking all the examinations for carriers during the five months the per cent of positive examinations was 42.05, while the entire work, including the hospital cases also, gave a positive result in 44.23 per cent. The figures are of interest in comparison with Mayer's after the Munich epidemic, who evidently paid no attention to selecting his carriers, and must have swabbed everybody indiscriminately, for he gives only 2 per cent and a fraction of positive findings, and declares that the investigation does not pay for the time and money it costs; in the Glasgow epidemic greater care was used and the per cent of positive examinations was 35; in the Dallas epidemic care in selecting the cases to be swabbed has put in the hands of the public health official a sure and comparatively easy and inexpensive method for detecting the carrier before he becomes a patient or spreads the disease among others. The essential thing, to which all the investigation leads up, and which unfortunately was entirely neglected by the city authorities in Dallas, is to make sure that the carriers, proved to have meningococci in their upper air passages on the first examination, actually do use a satisfactory spray, and use it thoroughly and often. Had this been done there would have been fewer cases and the outbreak would have been controlled far sooner than it was. For this purpose doctors who can spare an hour a day should be sent to central locations and the carriers should be required to meet them and have a thorough spraying done. Those who would agree to buy and use an atomizer should have a standard "Board of Health Spray" furnished them at cost, or, where too poor, for nothing; others could be attended to at these public free throat clinics, and, with a little forethought, somebody could be at the place and ready nearly all day. Unless something of this kind is done mere throat-swabbing will degenerate into a statistical farce, as it practically did at Dallas. The spray which I found of most value for such purposes was:

Camphor, thymol, menthol, each..... 3 grains
Rub thoroughly together and then dissolve in
Abolene fluid ..... 1 ounce
Label "Throat Spray;" use freely four or five times a day.

It is important that the three solids be rubbed well together first until they make a liquid; the only complaint I have had of this spray was when the precaution was neglected and they were simply dissolved in the oil.

Of the first group of carriers, giving 59.61 per cent positive from the smears, the cultures from the same cases gave 53.57 per cent positive; and on second examinations the figures were 41.47 per cent positive for the smears, and

33.8 per cent for the cultures, the differences being probably due to the presence in the smears of meningococci, which would stain but would not grow, and also in some cases a few meningococci were overgrown by pus cocci and colon bacilli, both of which were very common.

The first of the 48 urines which was sent to the laboratory was given me to determine what effect the large doses of urotropin, which were part of the routine treatment, were having on the kidneys. The mistake was made early in the epidemic of advising large doses of urotropin, both for the actually sick and also as a prophylactic for the well, on the ground that the drug would be eliminated by the mucosa of the nose and throat as well as into the cerebro-spinal fluid, and thus protect from meningitis. I feel sure that there is a large harvest of damaged kidneys yet to be reaped as a result of this. The hospital cases, under large doses of the drug, very frequently had hematuria and evidences of acute nephritis. When the first of these bloody urines was submitted I suspected that the cocci would be found in it, and, on search of the sediment, discovered enormous numbers of them, and from this material cultivated them; and practically the same results were obtained in the rest of the 48 urines which I examined, very few proving to have no meningococci in them, though in some they were dead when received. This was another of the new observations made during this outbreak.

The gross and microscopic appearances of the spinal fluids, at first and succeeding punctures, are of interest. If seen early enough the fluid obtained from the spinal canal is as clear and limpid as spring water, and may contain no cells or cocci, but even then its reaction is less strongly alkaline than normal, its amount is increased, and it contains a higher per cent of globulins than normal, as may be detected by the butyric acid test. At a later puncture there may be but a few cells, mostly large lymphocytes, and few cocci, and the latter are all or mostly outside of the cells. still later the turbidity increases, and, on standing, a delicate veil of fibrin forms in the fluid, usually as a fine column hanging from the surface film, and at the same time a little sediment is observed. In the latter the polynuclears are beginning to be more numerous, and, if the case is progressing favorably, many if not most of the cocci are phagocyted. Still later the fluid may be opaque or frankly purulent, and the proportion of fibrin increased, and, microscopically, the polynuclears are in excess; there are numerous large endothelia, and both these cells are actively phagocytic and inclose most, if not all, of the meningococci; and by special staining the cocci inside are observed to be disintegrating. The following stain I employed during the entire epidemic and found of the greatest value:

Carbolic thionin	50
Carbolic fuchsin	90
Distilled water	250
Glacial acetic acid	2

This is flooded on the slide, after passing it through the flame, and allowed to stain cold one minute; by it the living cocci outside the cells are blue with the thionin, dead and dying ones are reddish to deep red, nuclei blue, cytoplasm light red, cocci within cytoplasm and nuclei are very distinct. The presence of any number of cocci outside of the cells is important for both prognosis and treatment; if the case is not doing very well, but practically all cocci are phagocyted and their red color shows them to be undergoing digestion in the bodies of the endothelia and polynuclears, it is not necessary to repeat the injection of serum, but if, in spite of apparent progress, any number are outside of the phagocytes, even with a good clinical picture, more serum should be used.

This leads to the action of the serum. While it has some lytic power on the cocci in the spinal canal, its chief function is to act as an opsonin and increase phagocytosis, and possibly also to exert a cytotactic influence on the phagocytes and bring them there in greater numbers. At once it appears from this that

the action of the serum must be limited to the spinal canal, from which absorption must be reduced to a minimum in the presence of the exudates which line it, and hence the systemic condition remains untreated. Acting on this view, I was led to give serum under the skin, as well as into the spinal canal, in the cases which came under my care at the first of the epidemic, for although absorption of it is slow, yet gradually some of it is absorbed, probably the greater portion, and serves to make antibodies to meet the systemic infection, and I did not then have my vaccine, to prepare which I had to wait for several vigorous strains in pure culture. Now I should give the serum at intervals into the spinal canal, but from the first I should add vaccine hypodermically in doses of five hundred million every five to ten days, according to the reaction, and this has never been severe, even where an immunizing dose of serum had been taken shortly before. The use of the vaccine later in the disease has proved valuable in hastening and shortening convalescence and decreasing the liability to the complications and sequelae which are often so distressing a feature of the disease. I am convinced that it may be employed to great advantage from the first to combat the systemic intoxication, and to lessen the proliferation of the meningococci in the upper air passages, which it does very promptly, thus lessening the danger of spread of the disease from the patient and also reinfection, which is probably all too common. I made my vaccine (and was the first to make a meningococcus vaccine, at least in this country) of four strains, one of which came from the nose of a member of the diagnostic squad and three from spinal fluids. I was carrying pure culture in my nose and throat at the time and suffering from profound toxemia. Within twenty-four hours of the first dose the upper air passages were dry, too dry for comfort; there were no more meningococci obtainable from them, and the general feeling of being sick and poisoned had disappeared. What it did for me and a number of others I am convinced would be valuable in the treatment of even the early stages, in conjunction with the serum.

SERUM TREATMENT OF CEREBRO-SPINAL MENINGITIS.*

By DR. CHAS. C. GREEN,
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Several years ago, before the work of Flexner had been given us, or even before he had succeeded in producing his wonderful serum, the words Epidemic Cerebro-Spinal Meningitis and death were almost synonymous terms, as nearly ninety per cent of all cases died. But today with the use of Flexner's serum we have been able to make one of the greatest reductions in mortality that the history of medicine has ever recorded, and for that reason I have selected this as a topic for my paper.

Pardon a few preliminary remarks relative to the contagion or infection, and the symptoms and prophylaxis of this disease before I take up the serum treatment proper. Our experience in treating one hundred and eighty-two cases has led us to consider this as an acute infection and communicable disease, caused, of course, by the meningococcus which gains entrance through the air passages, with chronic tonsilitis, chronic inflammatory conditions of the nose and throat and adenoids, as predisposing causes of the disease.

Our reason for believing this to be a communicable, infectious disease is borne out by the facts as result of close watch on all cases that appeared in Houston last winter. As for instance, in families where they were intelligent enough to follow our directions, we never had a second case, but among the lower classes, where our instructions were not followed out and the sanitary conditions were poor, we frequently had the second and some-

*Read at the sixth annual meeting of the Southern Medical Association, Jacksonville, Fla., November 12-14, 1912.

times the third case in one family. Another instance is in case of two nurses connected with the Health Department who were given careful instructions as to the care of themselves after the exposure of the infection; one was very careful and had no trouble, the other, however, was careless, not washing her hands nor treating her nose and throat properly and she developed a very severe case of meningitis, but it was diagnosed early and treated with the serum and she made an uneventful recovery.

If I had the time, I could cite a very large number of cases where the infection could be traced directly to other cases, but as my paper is on the serum treatment this will not be dwelt on.

The symptoms are by no means constant, but I shall spend a few moments relating a few cardinal bed-side symptoms which furnish sufficient grounds for a spinal puncture, which should undoubtedly be done for diagnostic purposes. Some of the most common symptoms are chill at onset, nausea, vomiting, occipital headache, Kernig's sign and finally the patient assumes the characteristic opisthotonos position.

The best prophylaxis is the proper care of the nasopharynx while treating these cases and careful cleansing of hands after any examination of patients. We also use the serum subcutaneously as phophylaxis with good results, but I never resorted to this procedure, depending upon careful cleansing of hands and nasopharynx.

With these few preliminary remarks let us pass on to the serum treatment of this disease.

The technique is simple, being the same as that used in administrating a spinal anaesthetic. The site of entrance is between the third and fourth lumbar vertebrae on a line with the level of the crest of the ilium. In order to intelligently make a spinal puncture we must remember the anatomical relations of the vertebrae, keeping in mind the fact that they overlap each other, and in order to enter the canal you should flex the back if possible and pass the needle upward to an angle of about forty-five degrees and slightly inward. If this procedure is followed, you enter the canal easily, and there is no mistaking the fact, because when you enter the canal proper, spinal fluid will flow out, slightly cloudy in appearance and in most cases with a great deal of pressure. It takes only a small amount of experience in order to be able to successfully make a puncture, despite the fact that some of our men would lead you to believe that only the skilled artist is competent to perform such an arduous task.

In preparing to perform a puncture, the hands of the operator should be as carefully cleansed as if he were preparing for a laparotomy, and the field of operation should be prepared with equally as much care, as an infection would super-impose a septic meningitis upon an already serious condition and a combination would be almost sure to cause death.

As a rule these patients are either delirious or extremely nervous, so we have found it very efficient and easy to first cleanse off the field of operation with a solution of iodine in benzine 1-1000, then let this evaporate and paint the area with equal parts of Churchhill's tincture of iodine and alcohol. As to the use of an anaesthetic in these cases, we simply let each case guide us as to the use of this, some needing it, while others have talked to us while we were doing the puncture, complaining of pain only when the needle passed through the skin and through the meninges. But when we did employ an anaesthetic, ether is always used, as these cases are more or less depressed and withdrawing the fluid reduces the blood pressure, consequently chloroform is absolutely contra-indicated. In withdrawing the fluid, we always draw off as much as possible, or until it begins to drop normally except in cases where there was very little pressure, then we draw off three to five c.c. more than the amount to be injected which was from twenty to thirty c.c., according to

the patient and the kind of serum used. If we used Mulford's we usually gave thirty c. c., but if the New York Board of Health, only twenty c. c. as an average dose. Having withdrawn the spinal fluid, it is an easy matter to diagnose the case, as a rule, since the fluid is cloudy, having about the same appearance as cocoanut milk. There is one condition where it may not be cloudy and still the disease be meningitis, and that is in making an early diagnosis. A specimen of the fluid should always be taken and microscopical examination made and even in cases where the fluid is clear you will be able to demonstrate the meningococcus intracellularis. Having withdrawn a sufficient quantity, connect your syringe and inject slowly, constantly watching the blood pressure, which is your indicator, and whenever it goes below a hundred, stop for a few seconds, allow the pressure to become equalized and then inject the remainder.

Following this injection, there is usually a temporary delirium for about six hours, with improvement in about eight to ten hours. This treatment is repeated in twelve hours and another specimen taken, but the serum injected without waiting for a report; a third injection twelve hours later, and so on every twelve hours until your patient is well. Our observations show that the average number of injections were three, but we had one case to get well with one injection, while several others required six or eight, and one thirteen injections before he recovered.

In treating these cases, it is well to know something of how the serum benefits the patient and know when you can declare your patient well. This is an anti-toxin, just as much so as anti-diphtheritic serum, being obtained from the blood of immunized horses. It is an interesting fact to know that the cerebro-spinal fluid in these patients has a low opsonic index and the Flexner serum raises this, thus increasing the patient's resistance. After having given the serum to the patient until the symptoms have subsided, you should not give a favorable prognosis until the fluid has been examined. After the examination, if the diplococci are intracellular, you may discontinue your treatment and give a favorable prognosis, but if the diplococci are extracellular, continue the injection of serum and consider the case unfavorable.

Having described our technique, let us turn to a few statistics and see what our results are. I shall not burden you with a long list, but just enough to give you some tangible information concerning the Flexner serum therapy and what can be gained by its use.

In Houston we had one hundred and eighty-two cases with seventy-four deaths, giving a death rate of forty and six-tenths of all cases, including those treated with and those treated without serum. Out of the total number of cases treated, twenty-nine did not have the serum, consequently the death rate runs up rather high, having twenty-one deaths out of twenty-nine cases, giving us the enormous death rate of seventy-two and four-tenths per cent, which, although high, is even lower than the usual death rate where the serum treatment is not used. But of the one hundred and fifty-three cases treated with serum, fifty-three died; giving a death rate of thirty-five and five-tenths per cent, showing a reduction of thirty-seven and nine-tenths per cent in favor of the serum therapy. Here you see that the death rate in cases treated with serum is still rather high, but when you stop to consider the fact that a large number of these cases absolutely refused to allow the serum to be given until the patient was so near dead that nothing short of a miracle could save them, you can readily see that it is hardly fair to place our death rate of cases treated with serum so high; but still, they have had the serum and must be placed in that list. However, I have taken the number of cases that had the serum within twenty-four and thirty-six hours after the onset, and our death rate in these cases is only a fraction over twenty per cent.

The cases from which these statistics were

obtained constitute the entire number of cases which appeared in Houston last winter and were not only treated by the health officers, but by the physicians at large, some of whom were not familiar with the disease nor the spinal puncture. Therefore, I believe that if all of these cases could be treated by men who are familiar with this procedure, the death rate would be still lower.

But death in cases of meningitis is not the only feature of the disease that has worried our profession. Before the use of Flexner's serum, after many hours of hard, conscientious work, physicians have had to anxiously await the time when the patient was discharged as cured only to see many of them so seriously deformed, or permanently injured as the result of this disease, that death itself would have been far better for the patient. A careful watch, however, over the one hundred and nine cases that were cured show only two to be permanently disabled, one losing an eye and the other losing the use of a hip, which was previously impaired by an old tubercular condition.

Therefore, in conclusion, it seems to me that there is one duty that the members of our profession owe to our country, and that is to aid in educating the people to such a point that they will submit to the serum treatment, which has been such a great factor in combatting a disease that has defied medical science since its conception. For in this treatment we seem to have an ideal method, one that not only saves lives, but has reduced the sequellae which are even worse than death itself. So, in the face of such facts, is it any wonder that we are all advocating the use of a serum which has been the means of helping to subdue a disease which has caused the physicians hours of unrest and toil and has caused the hand of death to visit the homes of many happy families and strike down the father or the mother, or even a son or daughter in whom rest the very heart of the parent, and has left indelibly stamped on the memory of those left behind the awful words, "cerebrospinal meningitis," the synonym of death.

DISCUSSION.

This paper was discussed by Drs. J. E. Colgin, Waco, Tex,; C. C. Bass, New Orleans; J. T. Halsey, New Orleans, and Bernard Wolff, Atlanta, but the Journal has failed to receive stenographic reports of the discussions. The paper is too important, however, to be longer delayed.

THE OPERATIVE VERSUS THE NON-OPERATIVE TREATMENT OF FRACTURES.*

By GILMAN J. WINTHROP, M.D.,
Mobile, Ala.

The impetus given the surgery of fractures by the recent admirable work of Lane, Murphy and others and the excellent results obtained by these surgeons have prompted, throughout the country, an amount of bone surgery which is largely to be deprecated.

The attention to minutiae of technic, the exact knowledge of anatomy, the mechanical dexterity and the special armamentarium, so necessary in fracture surgery, have been largely overlooked or not fully appreciated by many operators, and their results have shown the neglect thereof.

The purpose of this paper is to consider the operative indications and results of the open as compared with the non-operative treatment of fractures, rather than to discuss the theoretical advantages of one over the other.

Results, anatomic and functional, are the ultimate desiderata of our surgical efforts and should be constantly considered in electing conservative or radical measures.

No field of surgery has been more generally neglected, no results less satisfactory, both to surgeon and patient, than that of fractures. This deficiency of results was, I believe, largely due to carelessness on our part and a willingness of the patient to accept results functionally imperfect.

*Read before the Surgical Section of the Southern Medical Association, Jacksonville, Fla., Nov. 12-14, 1912.

With the advent of the X-ray great strides were made in the non-operative treatment of fractures, and this branch of surgery was raised from the inaccuracy of "bone-setting" to a degree of exactness hitherto impossible.

While the open reduction and fixation of fractures has been quite widely practiced by American surgeons, there still exists a wide difference of opinion for and against this method.

Cotton (1) summarizes the indications for operating on recent fractures as follows: "(1) Operable as a Routine: (a) Compound fractures; (b) fractures complicated with vessel lesions; (c) fractures complicated with nerve lesions; (d) patella fractures; (e) olecranon fractures; (f) fracture luxations, especially at the shoulder; (g) acromio-clavicular luxations. (2) Usually Operable After Trial of Milder Methods: (a) Carpal injuries; (b) fractures of femoral shaft. (3) Often Operable: (a) Humerus fractures; (b) leg fractures. (4) Operable on Occasions: All fractures in fit patients that promise better results as they lie, even though they have good care, provided that we can show good reason for expecting a better result from operation."

(A) Fibrous union six months after plating. Second operation demanded. (Case of Dr. H. T. Inge, Mobile, Ala.)

House (2) holds that certain conditions should govern the treatment of both simple and compound fractures. Failure to secure reduction in the usual non-operative way, failure to maintain coaptation without unavoidable resulting deformity and impairment of function should determine operative intervention in any case of fracture, provided all other conditions, including the operator's training and technic, are favorable to the procedure.

Babler (3) concludes, from a study of sixty-six platings, that: "Plating yields the best results in cases, (a) of non-union; (b) of compound fractures, with considerable displacement, and (c) of simple fracture of the humerus and femur, in which the skiagraph indicates the inefficiency of the closed treatment."

Darrah (4) favors operation in recent cases of fracture and dislocation provided a "satisfactory reduction cannot be both obtained and maintained by the closed method, there being no further contraindications." He concludes that most fractures are best treated by the closed method. Of 2,100 coming under his care, in but 5 per cent was operation considered advisable.

Estes (5), reporting the "Year's Work of Commission on End-Results of Fractures of Shaft of Femur," concludes: "It is evident that the open method itself introduces into the treatment of these cases such a very marked element of danger that the commission cannot recommend the method for general use or recognize it as a routine practice. In selecting cases in which it is impracticable to restore the fragments to their proper position and where mechanical means have failed within a reasonable time to produce proper restitution of the fragments, the open method may be employed, but then only by an experienced surgeon, and

one who habitually employs most thorough aseptic methods."

From the above it would seem that consensus of opinion would justify routine operation of compound fractures and of cases of persistent non and mal-union. There exists a certain hesitancy in advising open treatment of simple fractures unless the X-ray shows that reduction and fixation be otherwise impossible.

The methods of fixing the fragments, in the open operation, vary from the metal plates of Lane to the bone inserts and grafts of Murphy. It is beyond the scope of this paper to discuss these various mechanical appliances, but rather to broadly contrast and compare the open with the non-operative measures as fulfilling the requisites of reduction and permanent fixation of the fracture and the final results obtained thereby.

Mr. Lane (6) advises operation in practically all cases of fracture, and claims for the open method of treatment with plating that: "(a) They at once relieve the patient from the pain of any movement of the fragments upon one another. (b) They free him from the tension and discomfort due to extensive extravasation of blood between and into the tissues. (c) They shorten the duration of the period during which he is incapacitated from work, since union is practically by first intention and consequently rapid and perfect. (d) Lastly, and by far the most important, they leave his skeletal mechanics in the condition in which they were before he sustained the injury."

All of these results are to be desired and in the hands of a few skilled surgeons may perhaps warrant the routine employment of the open operation in all fractures.

General statistics as to the end-results of the operative treatment are, as yet, unobtainable. A casual study of the literature shows not a few deaths from shock, which must be considerable, especially in the manipulation and trauma necessary to effect reduction and fixation of the larger pipe bones.

Sepsis is the great danger and the number of fatal cases reported prove it to be by no means negligible. Minor grades of infection, resulting in osteitis, sloughing out of screws, etc., if not militating against the open operation, at least show the difficulty and frequent insufficiency of asepsis.

Removal of plates, bands, etc., located near the epiphyses in young subjects and in areas not sufficiently covered by soft parts, is almost uniformly necessary, and again subjects the patient to the dangers of shock, sepsis, etc.

(B) Fracture of plate and pulling out of screws, two weeks after plating from breaking of plater cast.

Tearing out of the screws and fractures of plates are not uncommon accidents and must be considered in the final analysis of the operative treatment.

It is not, then, a question of what fractures *may* be operated on, but rather what *must* be operated on. While the decision must rest largely on a study of each case, I believe, we may generalize the operative indications as follows: (1) Recent simple fractures, operable only when repeated efforts at reduction and

fixation by non-operative means have failed. (2) Cases of non-union and mal-union, operable as a class, provided no constitutional condition contraindicates. (3) Compound fractures, when the presence of infection is probable and the use of plates, wire, bone inserts or splints will prevent extensive loss of bone, excessive callus formation and provided the operative steps will not spread the infection to other important structures and parts.

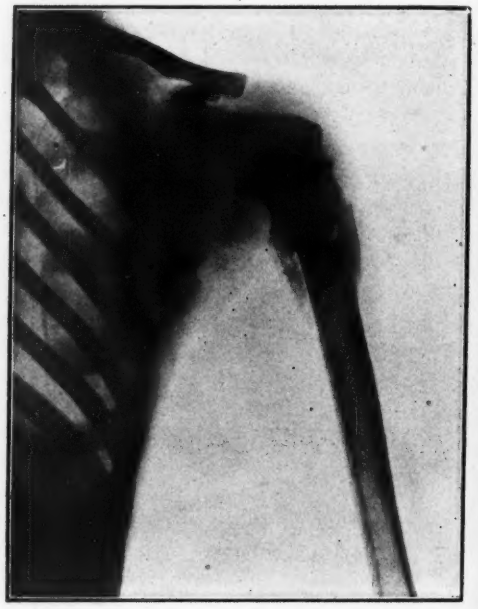
Fractures near joints and fracture-luxations offer especial difficulties to manipulative reduction and fixation. Limitation of movement from mal-union or callus, concomitant injury to the articular structures, etc., very frequently demand open treatment of these cases.

Reduction of deformity in simple fractures does not necessarily mean perfect axial alignment. In the neighborhood of joints a slight degree of deformity may limit motion, but in the shaft quite an amount of deformity may persist, with but little effect on function. The "active" and "passive" changes in joints from mal-union of shaft fractures, so strongly stressed by Mr. Lane, do not, I believe, very greatly impair function in most cases.

Decision as to operation is not immediately imperative in most simple fractures. I would favor the late operation—during the second week after trauma—rather than the immediate operation as practiced by Mr. Lane. This period permits of careful observation of the patient and, by means of the X-ray, of the results of our non-operative procedures.

Cases of non-union and mal-union are especially suitable for operative treatment. While they offer greater operative difficulties, the open method is one of necessity. Blind refracture of a bone is, today, unjustifiable. Constitutional disease, predisposing to non or to fibrous union, would contraindicate even the operative treatment. Especially in these cases do the bone inserts and grafts of Murphy offer especial hope of beneficial results.

The indications for plating or for using bone grafts or inserts in compound fractures are still not fully determined. The introduction of a foreign body into an already septic area can hardly be justified unless to prevent loss of bone or to preclude serious subsequent deformity. It has been shown that even dead fragments of bone act as a framework or scaffolding for reparative processes. If by fixing fragments, even in a septic wound, they may later subserve such function, without too greatly increasing sepsis, the procedure is fully justified. Where such indications do not exist, better surgery would dictate first healing of the wound with later operative procedures in a clean field.



(C) Plate on humerus, five-year-old child. Simple fracture. Imperfect alignment of fracture. Removal of plate for fear of interference with growth of bone.

It is understood that in fractures complicated with vessel or nerve injury, the indications of fracture must often be subservient to the greater necessity of vessel or nerve pathology.

If operative measures be deemed advisable a sufficiently large incision should be made to give full exposure of the operative field. Lane and others have called attention to the impor-

tance of the large incision in permitting the free introduction of long-handled instruments, which prevent handling of the wound and lessen the chances of infection.

Procedures which attempt to fix fragments without sufficient exposure can only result in imperfect technic and results. The methods suggested by Freeman (7) of fixing oblique fractures by applying screws through punctures in the skin and fixing a clamp external to the tissues, and by Morriss (8) of pinning fractures through a canula, guided by the fluoroscope, will hardly, I believe, prove successful.

CONCLUSIONS.

1. Open reduction and fixation of fractures, while an established surgical procedure, has a limited justifiable application.

2. The extensive employment of the open operation in fractures, especially by those lacking in wide experience, is to be deprecated.

3. Careful reports and statistics on fracture surgery are to be desired.

202-204 *Conti Street.*

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DISCUSSION.

Dr. Crisler.—We have not come to a definite understanding between ourselves as to what is best to do in cases of compound fracture. Murphy tells us—and he is, no doubt, the greatest teacher today on bone surgery—that his experience, both past and present, is that it is best to let these cases alone, in so far as any attempt to get the parts clean or antisepticised, and cites the fact that a great many such cases will recover that we think are hopelessly contaminated.

I think I will have to tell you of a few little experiences that I have had along this line—that is, in the use of iodine in those cases that you assume are infected. I will give you a case in point. A negro man, twenty-four years old, running an elevator in one of the wholesale houses in my town; by some carelessness his legs slipped under or through in coming up, and the elevator caught him in the left leg just above the ankle and on the right below the knee. He was rushed to the hospital and the internes were preparing him for an amputation. It looked as though not enough tissue was left to supply him with the necessary blood. To be candid, I could not tell whether or not he did have enough circulation to supply the parts, but I cleaned out the broken fragments that were not being held by the periosteum and were entirely loose, and some turned at right angles to the shaft of the bone; and he had ground into the wounds all sorts of dirt and pieces of sock and breeches leg, and everything else that could have been got into it in that kind of an accident. I cleaned it out thoroughly with the iodine mixture. Did not use anything else, not even water. Got immediate and perfect results in the right leg, and in the left leg we got perfect results in all but one place, and there we had to go back and take out a little piece of bone about as big as the thumbnail and remove the plate on that side, after which we had perfect results, and in three months the man was able to do his work in the store without crutches or canes.

If you will cleanse those bones with iodine, it does not hurt them; it does not seem to interfere with the osteogenetic processes; it probably stimulates them. You can, therefore, treat a bone surgically correct from the beginning; whereas the doctor said: "It is difficult to get absolute sepsis in dealing with bone."

If you are not quite sure about it, just take iodine and get the ends out and swab them, and you may get union without the usual delay.

Dr. R. C. Turck, Jacksonville, Fla.—Two years ago, in Chicago, I saw Dr. Murphy handle several crushing injuries—two of the hand, as I remember—by placing the crushed fingers in a bowl which contained a pure tincture of iodine. He claimed that following this he was getting primary union, and since then we have had some similar cases and they have worked out well.

Dr. Edward Martin, of Philadelphia, has given a very excellent summary of fractures. He states that each case must be handled with regard to its particular individuality; that cases of compound and old, ununited fractures and fractures which cannot be properly reduced by manipulation and held by external splints should receive the open treatment. He further states that the open method of treatment in all cases will be advocated only by those who consider a cure without cutting as a reproach to the surgical profession.

Dr. J. N. Baker, Montgomery, Ala.—I should like, in this connection, to stress one point: We all have, sooner or later, to treat these different injuries, and the most important thing, to my mind, is to try and treat the fracture in the simplest manner possible, without any operative interference, checking up carefully our first findings with the X-ray, and to make use of the frequent changing of the splints and ocular inspection of the injured limb. The average surgeon is, I fear, too prone to view fracture work in a light manner, and after the first dressing "to trust to luck and not worry much as to the ultimate outcome." The proper

treatment also must always be applied in the way of massage, passive motion, and the like.

My experience has been, in the treatment of compound fractures, that after a thorough sterilization of the wound with tincture of iodine, the less we do with those cases the better until they become, by healing, closed fractures; then, after we have treated the wound and made it a closed fracture, we can later take up the treatment of the fractured bones.

I am opposed to inserting any foreign substance, such as the Lane plate, into a compound fracture. My experience has been that you always get more or less sepsis, and your foreign matter does harm instead of good, and for obvious reasons.

I think Dr. Winthrop has rehashed this subject in a fair and accurate way—first, to treat the case as a simple fracture, with the use of splints, and without meddlesome interference of any sort. If, after these efforts, we fail to get satisfactory alignment of the several bone or bones, then operative measures should be adopted.

Dr. Winthrop (closing).—I have not much to say, Mr. Chairman. Dr. Crisler has called our attention to the efficiency of iodine as an antiseptic in these cases. About a year and a half ago I was impressed, upon a visit to Panama, with the use of iodine, which they were employing at the Colon and Ancon hospitals in traumatic injuries particularly. All cases were cleansed off with soap and water and the iodine used in the wound.

In compound fractures I have frequently swabbed out the wound freely with it, and found the use of it very efficacious, as in skin disinfection.

I have been a little wary in using the iodine in joint surgery. I will probably now try it.

Dr. Baker spoke of massage in the after-treatment. I consider this passive motion—massage—a very important factor in the treatment of these cases, and that is just one of the points against the use of the plate. Lane himself refers to a case where massage was used and the plate was fractured incidental to the massage. In one case I considered that the leg (a fracture of the femur) had been sufficiently long in the cast; I took it off, massaged, broke the plate, and had to perform a secondary operation. On the other hand, if the case had not been operated upon, I do not believe I would have had to reset the fracture.

THE OPERATIVE TREATMENT OF FRACTURES.*

By JOSEPH GRAHAM, M.D.,
Surgeon to Watts Hospital,
Durham, N. C.

The causes of delayed union and non-union of a fracture are usually classified under the heads of general and local.

Under the general head are named many constitutional causes, including age, sex, pregnancy, lactation, acute infectious diseases, anemia, rickets and syphilis.

Probably none of these except syphilis is of much importance. Practically all of the ununited fractures I have seen have been in active, vigorous adults.

Under the local causes of delayed union the most important are wide separation of the fragments, interposition of muscle or fascia between the ends, imperfect immobilization, impairment of nerve and blood supply, infection and suppuration; meddlesome surgery, including too frequent dressing; too vigorous passive motion and premature use of the parts.

Therefore, the most frequent cause of delayed union, and of vicious union, is sometimes imperfection of the local treatment. Successful treatment of fracture depends upon perfect reduction and permanent retention in accurate apposition of the broken ends of the bone.

A general anesthetic is *demanded* for the proper reduction of all fractures except the simplest. Whenever possible, all fractures should be skiagraphed after reduction.

Examination of many cases treated without the skiagraph has proven that in the majority of instances the loss of function and physical disability is due to imperfect reduction of the displaced fragments.

Local treatment is always aided by an early X-ray examination. It is often found that what was though to be a well reduced fracture proves to be far from satisfactory. In some cases reduction is possible, but cannot be maintained. The skiagraph is of especial value in diagnosing a fracture of joints. In many cases it will be seen that ordinary measures are useless and resort must be made to operative aid.

The operative treatment of fractures has gradually improved in technique and method until it is now one of the most successful and satisfactory procedures in surgery.

Operative treatment at once relieves the patient of pain from any movement of the fragments upon one another. The duration of

*Read at the sixth annual meeting of the Southern Medical Association, Jacksonville, Fla., Nov. 12-14, 1912.

the period of disabiilty is greatly shortened, as union is practically by first intention and consequently is rapid and perfect.

Operation restores the part to the condition the bones and muscles occupied before injury. Function is more fully restored by operative treatment than by any other method.

The greatest advantage of operative treatment is the saving of useful limbs—true conservation. Many badly mangled limbs can be saved. So long as the blood supply is sufficient to keep alive the peripheral parts, there is a chance. Far too many limbs are needlessly cut off. It is better that such a patient spend six months in a hospital if necessary and walk out able to make a living than to be discharged after two or three weeks with the loss of a limb. Who can estimate the value of a limb to a working man?

CASE No. 1, PLATE No. 1.
Non-union of radius, vicious angular union of ulna.

The time for operation requires some judgment: In cases seen early, where there is not much injury to the soft parts, operation can be done at once. Where there is extensive injury to the soft parts, operation should be postponed until all local inflammation has subsided.

In compound and gun shot fractures, the parts are not only lacerated, but are usually infected, therefore, we should first treat the infection and laceration of the soft parts and deal with the fracture later after all inflammation has subsided. The wound is then cleansed and closed and the fracture converted into a simple fracture.

CASE No. 1, PLATE No. 2.
Result obtained in Case No. 1 by resection of bones and application of plates and screws.

Operation performed during acute inflammation in the presence of infection can only result in failure. The first essential in the operative treatment of fractures is perfect asepsis. To insure that the wound shall be as sterile as possible every precaution is taken to get the skin clean. The skin is then covered with a sheet of boiled rubber tissues. The incision is first made through the rubber tis-

sue and then through the skin. The edges of the rubber are fastened under the incised skin so as to completely exclude the patient's skin from the wound.

Although gloves are constantly worn it is best to handle the wound as little as possible. It is possible to complete the operation without touching the hand to the wound. The swabs are manipulated on hemostats; the bones are held by forceps and resected with wire saw. The holes are drilled by long handled drills.

The incision should be so placed as to give ready access to the fracture with as little damage as possible to the soft parts. The fragments should be elevated and the ends freshened or resected, and then placed in accurate apposition.

To retain the fragments securely together, we prefer silver plates and screws. These plates are made by local jewelers and modeled to suit the individual case. Flexible plates are very useful in fitting irregular bones. Experience with absorbable sutures has been unsatisfactory. The sutures break and allow separation of the fragments and interposition of muscle and no union occurs.

Silver wire is unsatisfactory because it forms a curve and cannot maintain an accurate firm apposition when a force tending to displace the fragments continues to be exerted.

For drilling the holes for the screws, we have used both the hand drill and the electric motor. Experience is necessary to properly do this portion of the work; therefore, we always have the holes drilled by a D. D. S. The dental surgen quickly and accurately places the holes for the screws.

In placing the plate the operator should attach it so that it does not make a projection on the skin. It should be well covered with the soft parts. It is necessary to secure perfect hemostasis before closing the wound. The tendons should be accurately replaced and the deep fascia carefully sutured. It is needless to say that great care should be exercised to avoid dissection errors and the wounding of important vessels and nerves.

A small drain of rubber tissues left in the wound for 24 hours will allow the escape of oozing blood.

Some form of splint support is necessary for a few weeks, but the joints above and below must be exercised to prevent stiffness.

Great care should be taken to see that the tendons of a limb are working freely and smoothly. The inflammatory exudate sometimes catches the tendons running over the fracture and great impairment of functions results.

When the plates are covered deeply and well covered by muscle they rarely cause trouble, but when superficially placed producing pressure on the skin, suppuration frequently results.

It is a simple matter to remove the plates and no harm results from their removal as they have served their purpose, the production of rigid, bony union.

We wish to present a few radiographs and case reports to illustrate how easily and effectively, fractures, either simple, compound or ununited, can be treated by means of screws and plates.

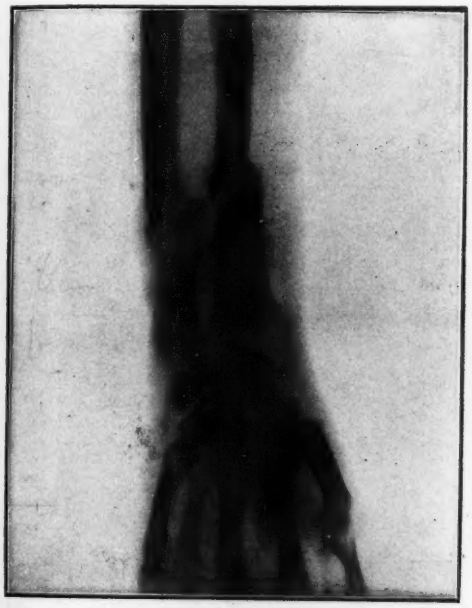
VICIOUS ANGULAR UNION OF ULNA NO UNION OF RADIUS.

A. L. B. 32, wt. 180—Twelve months before coming to me he received fractures of the ulna and radius, right arm, in railroad accident in West Virginia. Received prompt attention and was in splints for eight weeks. After removing splints he received a fall and arm bent. Sought service and operative treatment was advised and declined. Patient then carried arm in a leather sling nine months and was wearing this sling when he came to me. Had not used the arm for twelve months. I made skiagraph No. 1 and advised operation. Advice accepted.

Operation—An incision four inches long was made over the dorsum of each bone. The soft parts retracted and periosteum elevated.

The ulna was rigidly united at a bad angle, there was no union of the radius, the ends being black and soft. The radius and ulna were united near elbow joint through displacement of the radius. I separated this false union between the two bones and then did a resection of both radius and ulna and sutured the ends together with chromic catgut, closed wounds without drainage, applied splints fixing elbow and wrist joints.

Results—Union of radius, no union of ulna. Catgut suture broke and allowed interposition of muscle between ends of ulna.



CASE No. 3, PLATE No. 5.
Showing no union in case of compound fracture of both bones of forearm.

CASE No. 3, PLATE No. 6.
Showing plates and screws in position after resection of Case No. 3, Plate No. 5.

Second Operation—Same incisions, retraction of soft parts, elevation of periosteum and resection of both bones, then applied silver plates and fixed these with silver screws. Sutured wound without drainage and applied plaster cast from fingers to shoulder, trapping cast over wounds.

Results—Wounds healed by first intention. Rigid union of both bones. Perfect function of the arm. Man is doing hard farm work and tells me that he suffers no inconvenience. The silver plates are still in place and so far have caused no trouble.

NON-UNION OF FRACTURE OF CLAVICLE.

When called to this patient I learned that this was the third time that this bone had been broken. The first fracture was due to a load of coal falling on him while in naval service. He received prompt attention and had the Sayre dressing applied. Was in hospital six months before he obtained union. Practically the same length of time was required for the second fracture.

On examination reduction was easy, but immobilization very difficult. The ends would glide over one another. Little, if any, crepitus was heard. I then made skiagraph No. 3, and decided that he had never had bony union, and therefore advised operative treatment. Ad-

vice declined and I retired from the case. A few days later I was asked to operate.

Operation—Incision over clavicle and retraction of the soft parts revealed rounded ends of the bone. Had fibrous union, no bony union. I resected the ends and plated them together with silver plates and screws.

Result—Wound healed by first intention. Rigid union of the bone and perfect function. Skiagraph No. 4 shows the result several weeks after he returned to work.

Case No. 3—Compound fracture of both bones of left forearm. C. F., age 42, left arm caught in belt of machine, fracture of both bones by wringing the arm. Both fractures compound—soft parts severely lacerated—are extremely dirty.

Treatment—Watts Hospital; general anaesthetics; parts shaved and cleaned. Bones replaced; wounds dressed in salt solution. Injury would not bear splints; limb placed in moulded trough. Result, severe infection. Cellutitis, requiring several incisions and drainage for several weeks. Two months later bones resected and plates and screws applied. Result, rigid union of both bones. Good functional use of arm.

Plate No. 5 illustrates positions of bones after wounds healed and inflammation subsided.

Plate No. 6 shows the result obetained by operative plates and screws in position.

Case No. 4—Gun shot fracture of astragalus and metatarsal bones. Referred to me for amputation. On admission to Watts Hospital, temperature 105 2-5, pulse 150. Gun shot wound through left foot produced accidentally by gun in neighbor's hand—didn't know it was loaded.

Treatment—General anaesthetics; wound cleaned; fragments of bone. socks and shoe and many shot and wads removed, through

CASE NO. 9, PLATE NO. 12.
Supracondyloid fracture of humerus. Treated by operation. See Plate No. 13.

CASE NO. 9, PLATE NO. 13.
Supracondyloid fracture of humerus. Operation a failure; sutures broke; displacement in splint. Will operate again.

and through tube drainage instituted. Wound dressed in salt solution. Continuous irrigation with normal salt solution for one week. Sepsis gradually improved and wound healed. Four months later we operated, removing portion of astragalus, suturing fracture of the second and third metatarsal bones and making a new joint for first metatarsal by covering the freshened rough end with layers of fascia and fat.

Result—Perfect functional use of foot. Patient wears no support except ordinary shoe—serves as pitcher on his baseball team.

Plate No. 7 shows the result three and one-half years after operation.

Case No. 5—Fracture, dislocation of left humerus. R. M., age 37, farmer, physical giant.

Five months previously sustained injury. Reduced by family physician under general anaesthetic. Diagnosis made by family physician was dislocation of shoulder joint. Pain and loss of function continued and he was advised by family physician to enter hospital. Advice declined for five months until his sufferings became unbearable. On his admission to the Watts Hospital an X-Ray picture was made showing fracture of the upper end of left humerus and the head of humerus dislocated and fractured occupying subcoracoid position. The patient's neck was drawn to side and stiff, shoulder fixed and held rigidly to side, muscles atrophied, wrist drop; hand abducted, skin of arm and finger nails showed extreme atrophy. Patient unable to arise without assistance when reclining or sitting, suffering severe, pain in shoulder and arm.

Operation—Long anterior incisions, head of humerus under coracoid found to be necrotic; excised, then projected humerus through wound and resected one inch of upper end of humerus. Covered end with periosteum. Passive motion in a few days. Result: Perfect functional use of hand, forearm and elbow. Movable painless joint at shoulder. Patient does hard farm work. Can reach back collar button or top or head with left hand; puts on overcoat without aid.

Plate No. 8 shows condition of shoulder three years after resection.

Case No. 6—D. S., age 8. arm crushed in grist mill. Brought to me for amputation. Examination, forearm wounded and crushed; multiple compound communited fracture. Skin and muscles severely lacerated and mashed, arterial circulation not injured.

Operation—General anaesthesia; wounds cleansed; fractures sutured; silver wire; drainage instituted.

Result—Infection requiring incision; removal of silver wire. Several incisions for suppuration.

Second Operation—Six months later fractures of both bones ununited; ends resected and sutured, rigid bone union, good functional use of arm, movements of fingers somewhat impaired by adhesions of tendons.

Comments—Experience teaches that this case would have obtained better results if we had only treated the laceration and infection and disregarded the fracture until the subsidence of all inflammation. Operation performed in the presence of infection during the height of inflammation will always result in failure.

Case No. 7—Fracture of lower ends of both tibia and fibula; both fractures ununited— osteomyelitis.

Mrs. S. A., four months before coming to me she received injury of right ankle; still using crutches; unable to bear weight. X-ray examination revealed oblique fracture of fibula and tibia. Both fractures ununited. Patient complained severely of pain over internal surface of tibia.

Applied plaster cast—worn four weeks—removed on account of pain. Examination revealed undoubted osteomylitis of tibia.

First Operation—Incision revealed abscess in bone. Thoroughly opened and drained; cavity soon healed satisfactorily. Patient not able to bear weight on limb. Skiagraph shows

non-union of both fractures and also lateral deviation of astragalus.

Second Operation—Both fractures exposed, edges freshened, fibula sutured; did not suture or plate tibia on account of previous abscess, but thoroughly freshened the fracture. Adjusted the astragalus and placed in plaster.

Result—Rigid bony union of both bones, good functional use of foot. Applied an ankle support and arch for flat foot of both feet and patient walks well and comfortably.

DISCUSSION.

Dr. E. Denegre Martin, New Orleans, La.—Dr. Graham would give the impression, it strikes me, that doing this work is very simple. I think it is the most difficult surgery of all. I would rather do ten laparotomies than plate one fracture. The results are very satisfactory, but it is one class of surgery that you have to be very careful with.

I suppose that I do as much of this class of surgery as any man in New Orleans—probably averaging twenty-five cases a year—and I am not yet satisfied with my work. Put on a plate, then have to take it off afterwards, and you find you have some operation on your hands. The results are fascinating, especially Lane's work, but Lane is a general in that class of work.

I am not criticising the doctor's work. It is simply to keep the inexperienced from being misguided or rushing in too rapidly. Wherever we can set a fracture and get a good functional result, unless we have had a pretty fair share of experience in surgery, we had better not attempt bone plating. Bones are more easily infected than the peritoneal cavity, and you not only run the danger of non-union, but a vicious union, and complications that will last a long time.

I think that we should study more the causation of fractures, knowing that direct violence probably causes a transverse fracture. A transverse fracture can be put in apposition and held very readily with a splint in most cases. You must know something of anatomy and remember something of where your fracture is located, and if once reduced under an anesthetic and gotten in good apposition, I believe you will get a good functional result and avoid the danger of infection.

I was the first to introduce a staple of steel wire, which, when driven in, holds the parts absolutely in apposition; and it has this advantage—that you can operate through an opening three inches long, whereas to put on a Lane plate will require more space and time and produce more trauma. Put in two staples, one on either side, which must go through and through, just as your screw should penetrate the entire shaft of the bone. The staples are also more easily removed than plates.

We have failed in the past with wire and staples because they were loose and acted as foreign bodies, but if you will put in a staple which, like a plate, holds firmly, you will get as good results. When you fail, do not blame the plate. Remember, you have to take other things into consideration—infection, tuberculosis, syphilis, etc.

I think if we will go along and report all of our results, we will find that they are not always encouraging. We have probably twenty plated by this time, and when we take a skiagraph by a certain angle it is beautiful, and by another angle it is discouraging. Let us select our cases and operate on those cases only which we cannot reduce and hold in apposition by simple means.

Dr. Graham (closing).—Mr. Chairman and gentlemen, I think possibly I was slightly misunderstood. I do not advocate operative treatment of fractures as a usual routine, only in cases in which X-ray examinations show that other measures are not going to be satisfactory—that we cannot accomplish reduction and maintain it. I believe in making X-ray examination early, so as to save loss of time and embarrassment that may occur.

In regard to the difficulties of operative treatment of fractures, I agree with all Dr. Martin has said, and I think that you all agree with me—*the fractures are the class of cases we don't want.*

When I first commenced practicing I had a lot of trouble. I then realized the difficulty was that I did not know the mechanics of the conditions, and in later years I have tried to improve in learning—to see what the actual displacement is and what is to be accomplished in a mechanical way.

In regard to Dr. Martin's size of the plates, I must say that I do not agree with him. I have put a plate on the femur not much larger than I would use on the humerus, and have gotten satisfactory results. We use a plate like we would a catgut suture—for apposition only, not for retention. That wound is opened, the plate put on the fractured ends of the bones, then a plaster cast immediately applied and the bandage put around. The plate is only to hold the bones in position, but the cast really does the work.

In regard to the screws coming out, Dr. Wheat, I would like to say I have only had one instance, and that was in a case in which I made the mistake of operating before the infection and inflammation of a compound fracture had completely subsided.

That is one point I want to put before the profession. In all the South we do not realize the difficulties of the operation. Like Dr. Martin, I would rather do ten laparotomies than one of these operations, and we do not realize that these operations are only to be done on clean cases. I do not believe that point has been fully enforced, and they are attempting to put these plates in the compound fractures, and I do not believe one per cent of it will ever be a union in compound fractures. It is the putting the plates on compound fractures which will bring this work into disrepute, unless this profession takes notice of it.

SOME THINGS THAT PEOPLE SHOULD AND SHOULD NOT FORGET.*

By DR. JOSEPH Y. PORTER,
State Health Officer of Florida,
JACKSONVILLE, FLA.

The pendulum of world-wide sanitation is at the present time swinging unsteadily in practical methods of health conservation, and if health officers are to retain the respect as well as confidence of the people, an equilibrium must be preserved between a hysteria of meddlesome interference and an apathy of neglect and indifference, for there is a wide gap between the two that needs to be closed and can only be bridged by sound reason and sober judgment. Unfortunately, the present tendency seems to be to magnify the importance of the shadow, before the substance is well seen or understood, or has been thoroughly tried out; in other words, the mere announcement of a supposed discovery of cause, or source of an obscure disease, without waiting for positive confirmation, is taken to be a sufficient assurance for formulation of a rule governing its management, especially if of a conjectured contagious character, and conclusions are jumped at, without reasonable warrant. Like one class of therapeutists who order medicine given every fifteen minutes or oftener, and another class who give no medicine at all, the lack of balance is apt to bring the whole system both of medicine and sanitary science into disrepute with the people.

The citizen of today is far in advance of his neighbor of ten or twelve years ago, in a knowledge and understanding as well, of the facts which produce disease and contribute to its consequences. The average resident of even the rural districts of this great country can no longer be satisfied by being told that this or that is "unsanitary," when he asks about matters relating to, or having a bearing on his health and the health of his family. This man needs to be shown, for he reads the current literature, which can be had for a small cost and from which he gains information concerning micro-organisms and germ life. He is not contented with just a "say so" without a reason, and demands to know why such and such is said to be unhealthy in its action, and what process or processes of life have transformed something which heretofore was thought to be harmless into an element dangerous to his health and perhaps life. The popular magazines which are within reach of almost the poorest of the population, have been wonderful developers along this line of thought, and have stimulated both a desire to know more of the hidden things of nature, as well as a studious consideration of the subjects pertaining to sanitation and personal hygiene. Therefore, the health officer must be always prepared and ever ready to tell the facts of sanitation that have proven to be true, and must frown upon speculative suppositions and theory, whereby the minds of the people may be confused or befogged. It goes without saying, that the man who would be a leader or teacher in sanitation must be a live and aggressive preacher of the gospel of preventive medicine, for he has a double duty to perform to the public; while endeavoring to lead them into a correct path of healthy living, by telling the truth as known about sickness and causes which produce disease, he must at the same time and with equal energy persuade the people to forget superstition and "old women fables," which have so long held sway in some mysterious way over hygienic requirements.

As an educator his mission is to convince by proof, supposing nothing, and taking nothing for granted that has not stood the test of experience, and point out the truth and correctness of his convictions, so clearly that there cannot lurk a doubt in the minds of his pupils —the people—that he is not thoroughly acquainted with the subject he is talking about.

*Read at the sixth annual meeting of the Southern Medical Association, Jacksonville, Fla., November 12-14, 1912.

The public will no longer be put off with a few vague technical phrases and a mysticism which it cannot understand, and the health officer must give a reason for the "faith that is in him" and such explanation that if the subject has not yet been perfectly worked out and the problem solved, he may be at least credited with having studied conditions and probable cause, or else he must stand convicted by his own ignorance, or worse yet, of deliberately trying to delude the people. When we say we think such and such a thing to be the case, a doubt lurks behind the expressed opinion that we may be wrong, at least not altogether positive of our position, but when we say we know, there is no doubt expressed or implied; on the contrary, a firm conviction of truth is asserted. Now it is because the people are seeming to take more interest in sanitary matters, and are showing a keener desire to learn accurate facts about health and its preservation, that I would urge upon the health officers' section of this association the importance of starting the people out rightly in the search for truth, and not leave them to be led astray and trapped by charlatans and patent medicine vendors. Human nature is susceptible to flattery and it pleases the average man or woman to think that he can be his own doctor or health guardian. The wrappers on patent-medicine bottles and packages beguile the credulous by tales of miraculous cures at death's door. The American Medical Association, in an effort to correct this, has established a bureau of public speakers, who are to deliver lectures on sanitary subjects in different states, and while much good will result from this effort to teach the public, yet a campaign of education in practical methods of health management must be carried on by every practicing physician in the land, and every doctor must be a missionary in this work if the people are to be freed from superstitious ideas concerning preventable diseases. In the first place, doctors themselves need to learn quite a few things in order to unerringly teach others. Every now and then we run across a medical man who has not yet been convinced that malaria is mosquito borne. What he believes or does not believe finds echo in his patients, for in the country districts the doctor is the oracle of all knowledge. Therefore, until the medical profession is lined up properly those of us who are charged with directing thought on sanitary matters in a right direction are going to have a diffcult task in persuading the people that we are correct in our teaching. I mention malaria because the people are seemingly more bewildered in regard to the cause of this trouble than other diseases. It has been the custom for so long to attribute malaria to a miasm or marsh gas, and to the effluvia from low, sloppy ground that it is a hard matter to persuade country folk—not because they are country folk, but for the reason that chills and fever is almost distinctly a country sickness—that they are holding to a false idea, and that not the marsh nor the low ground is the cause of malaria, but the insect breeding therein, when infected by a peculiar parasite.

Sanitary matters and things relating to personal hygiene are not difficult to understand if this maxim is borne in mind; that cleanliness in every turn and twist that the word can take is the keystone of sanitation, and that when combined with common sense and sound reasoning the principles of sanitation have been closely approached, if not altogether solved.

Suppose we argue this a little further. We see that a study of sanitary science is mainly made by those who are preparing themselves with a special object in view, and that from this study certain facts are learned which, when put into practical use, can be of benefit to the human race. But theory and practice, while akin, are not the same any more than the methods of a business college are those of a banker. In the work of one there is speculation, while the other is characterized by a direct, energetic way of "doing things"

on a common sense basis. In one the causes of disease, manner of spread and methods adopted for prevention are worked out in the laboratory; in the other this laboratory information is supplemented by extended epidemiological inquiry, and by bedside practice, and is presented to the people in such a plain, simple way, easy to execute, that there is no misunderstanding of the purposes for which advice is offered. This is the ideal method of dealing with practical sanitation, and is the only way by which the masses can be directly benefited.

I believe that in the carrying out of sensible hygienic principles we are on the eve of a reversion of previously conceived ideas on the transmission of many of the communicable diseases, which we have heretofore thought to be due to atmospheric influences, or in some mysterious way to confined gases. No one who has closely followed the experiments of Chapin, Doty and others in detail, and who is not blindly wedded to ancient notions, can doubt for a moment that we have been doing very many unnecessary things in the name of precaution, and have caused much needless expense and inconvenience on the ground of prevention of contagion.

Terminal disinfection in the majority of instances in connection with the greater number of the communicable diseases is now considered unnecessary, because pathogenic bacteria tend to die very rapidly after being discharged from the body, and because there is very little bacteriological, and less epidemical, evidence that things, such as clothing, remain long infected after contact with the sick.

The preponderance of evidence in transmission of communicable disease is that the person, not things, is the direct cause, and that it is infected persons, not things, that are to be feared. If this is true doctrine, and I believe it is, from my own experience covering a period of forty-odd years in health work, then terminal disinfection in the great majority of instances is an unnecessary procedure as a precautionary measure, and has but little value in preventing the spread of the commonly known contagious diseases. Both Dr. Chapin and Dr. Doty believe that this sort of disinfection is a powerful factor in preventing sanitary progress, and I quite agree with them.

Referring again to these distinguished authors, the arguments for disinfection of houses, bedding, books, toys—and many more objects might be mentioned—which have been said to harbor an infection, are faulty because the cases reported have very rarely been authenticated. For example, at one time we thought that yellow fever was conveyed from one person to another by fomites and objects which had become infected by the yellow fever poison. We now know that that theory is altogether wrong, and so many other notions, with no better foundation, which have been formed concerning the transmission of other communicable diseases may be just as faulty. While a true explanation of the spread of the contagion is in some instances unrecognized, or carrier case; while it is by no means advisable that disinfection should be abandoned altogether, yet it should not be made so important a part of public health work, and, except in certain cases, should not be practised; and, furthermore, should not be made a routine measure of sequence to all cases of communicable diseases. Citing diphtheria, Chapin says that disinfecting a house where a case has occurred is a useless measure so far as insuring safety is concerned, unless it is positively known that every member of the household is uninfected. What is true of diphtheria is, or may be, equally true of other diseases, and as disinfection is costly and troublesome, without promising more security to health than sunlight, fresh air, soap and water will give, it would seem that health officers should abandon such methods. There are two terms in general use by the common run of people when speaking of control of communicable sickness. I refer to quarantine and disinfection. Both are the

products of the age when eccentric people were judged to be witches and were hanged, and when cockroaches in decoction was a guaranteed cure for asthma; and both as practiced in routine health work are today useless as factors in the public health.

There are some things connected with the subject of general sanitation, and special sanitation likewise, which health officers are perfectly acquainted with as perfectly as they know the alphabet or the multiplication table; some things that the laboratory has taught and experience has confirmed, and which are fundamental truths. These the health officer should tell the people and so explain the reasonableness of the facts as they have been proven that there may be no hesitancy in accepting them. But on the other hand, there are causes operating all around us that we do not understand, and the nature of which the microscope has not as yet revealed. It should not be considered an evidence of ignorance to frankly say, "I do not know."

When property values are involved the health officer will frequently be confronted with a question of weeds as a factor in the public health, and if he is not fortified with knowledge and above all with common sense so that he can with facility point out that the difference between weeds and flowers is an aesthetic one, and that the former, however rank, have no more influence upon the public health than the latter, he will lose his hold upon the confidence of the people. Questions of drainage will confront him because it will be held that the miasma, the vapors from swamps will produce malaria. Here again he must be fortified with proof. And common nuisances, such as bad odors, will rise up to stare him in the face, and all the pressure that a frenzied public can devise will be brought to bear upon his office to convince him that these smells will make everybody sick. But he must be able to show that odors, however disagreeable, are not factors in the public health; that people working in guano factories, or even sewers, live as long and enjoy as good health as people under more pleasant conditions.

Avoiding abstruse questions of sanitation, as health officers, let us direct public thought to those means for preserving the public health which have been proven out and amply demonstrated.

It is the practical methods in health conservation which the people can understand and which they will follow that will add to the wealth of a state or community. It is this means of lessening sickness and increasing longevity which we must practice. It is the measures and methods that the common run of people can see and understand that are to count for the health of the people, and this fact must not be lost sight of. It is only the obstinately perverse and prejudiced who will deny the truth of what is proven to them, and such persons must be forced to conform to well digested certainties, so that their obstinacy may not injure their neighbors. I know, however, from my own experience that in the general run of management very little difficulty is had in gaining every point in sanitary control, as it exists in ordinary towns and communities, if the trouble is taken to explain the reasons for asking co-operation, and then only to ask of a community such practical measures as time and experience has shown can be effected. It is unreasonable to suppose that intelligent men and women will blindly accept an order to do something on the plea of health requirement that they can't understand the motive for, unless a rational explanation is given for the request. Sanitary patrolmen should be well informed on necessary or indispensable conditions, but should be extremely careful not to confound civic cleanliness with sanitation. Clean streets, clean yards, well-kept lawns, and I might add well-painted houses, are all a source of civic pride, but the lack of either will not cause sickness and cannot be classed with unsanitary situations. There is no disputing facts, so when it is

shown to a community how flies may carry infectious material from open closets to where food is prepared and served in homes, and that as proportionately as attention is paid to this fact by screening kitchens and dining-rooms, typhoid fever will decrease, we have proven our point, and as our friends of the legal profession say, "the state rests." This statement has been amply proven by Dr. Terry, the efficient health officer of Jacksonville, when, after a hard struggle, he compelled open closets in the unsewered portion of Jacksonville to be screened against flies. In statistics and diagrams he shows a decrease of over 50 per cent in the number of cases and a similar decrease in mortality of typhoid fever cases over the previous years, before the screening ordinance was enforced.

Persons living in so-called malarious districts of the country when persuaded to try screened living rooms, or to sleep under mosquito nets, have enjoyed a freedom from malarial fever when in previous seasons they were continuously sick. We, as health officers, know that typhoid vaccine has been tried out both in the British and United States armies with success, as giving immunity to typhoid fever, but do the people as we find them know this? Those who read and attend lectures or lyceum courses are acquainted with these discoveries, but the general run of mankind as is found in our towns are yet ignorant of the vaccines and anti-toxins and other sera which give immunity to certain contagious and infectious diseases.

When Dubini discovered a parasite which infested the intestinal tract of animals, and which he called the Ankylostoma Duodenalis, the announcement attracted but little attention except to those interested in parasitology, but when Dr. Bailey K. Ashford, a major in the medical corps of the United States army, and a native of our own Southland, stationed in Porto Rico, found that the anemic sickness of that island was due to an intestinal parasite of similar appearance, which could be destroyed and eliminated by simple means, and its former victims restored to health and vigor, he conferred upon sanitary science in a practical way a priceless benefit. While Dr. Ashford did not classify this parasite, his name, when history makes its final entry, will be inseparably linked with the Uncinaria Americana, commonly known as hookworm of the Southern United States; for although it is not generally known, because of his modesty and retiring disposition, yet to him, more than to any one else, is due the credit of working out the problems which emancipated over a quarter of million inhabitants of Porto Rico from a living death, and restored the working ability of the people, thus adding inconceivably to the wealth of the island. He has not only raised a monument to himself in solving the hookworm problem of Porto Rico, but in a broader way of solving the hookworm problem of the world in general, for which we of the South are particularly indebted to him.

It is here more than in any other part of the world, aside from Porto Rico, where the results of his discovery are coming to full fruition, and where thousands of little sufferers, now coming to their own in a happy, vigorous childhood, will sing his praise and honor his name.

The "show-me" idea, which demands proof as indispensable to belief, has grown out of the fact that health officers themselves are oftentimes doubtful of their own management of disease. The people cannot be found fault with in their skepticism when those at the head of health organizations become hysterical and are guilty of irrational practices. When a case of leprosy, anterior-poliomyelitis or pellagra will bring forth regulations for the control of those disorders, which are so utterly at variance with common sense, and are not demanded by anything that is now known of the etiology of these diseases, the wonder is that any faith at all is manifested in health

boards and their opinions. Quite lately the public has been treated to several instances where lepers in this country have been hounded from pillar to post, and treated with all that may be said of "man's inhumanity to man," when the consensus of medical opinion based on reports of royal commissions and extended investigations in Hawaii, all go to prove the slight contagiousness—if any—of leprosy. Such inconsistent action as quarantine of leprosy becomes still more absurd, when the same health authorities who have become frenzied by farcical fear over one case of leprosy permit consumptives by the hundreds to live unmolested among them, ride in their cars, and frequent their playhouses; nay, more than that—offer inducements for this class of invalids to come among them. Leprosy will be shunned and the unfortunate will sooner or later hide himself or herself from the gaze of the public. Besides, leprosy is not anywhere near as contagious or infectious as tuberculosis.

When pellagra as a distinct disease came into prominence, and some of the health boards of the country went wild over corn and cornbread as the producing cause, a hue and cry went up from the extremists in preventive medicine that cases of pellagra should be quarantined. Was the producing cause known? No. Was it contagious? Was the evidence that it was contagious convincing? No. But still pellagra victims must be secluded, and the edict went forth from—I am glad to say only a few—boards of health to quarantine pellagra. Now, a few years later a resolution is promulgated from the third International Congress on Pellagra that cornbread does not produce pellagra, neither is it known what does, or how it is conveyed, and that it is not *contagious*. What do the people of those states think of? What confidence must they have in a board of health which is supposed to deliberately and maturely consider evidence before restricting citizens in their movements. And the same thing can be said of the hysteria which is shown in dealing with cases of poliomyelitis. If we, as health officers, are not going to keep our heads clear, and sit steady in the boat, and refrain from emphasizing by our actions undigested opinion of contagion which some theorist may advance merely that we may be "the first on the ground to do something," we surely will lose the confidence of the thinking people of the community where we are supposed to have our strength.

It seems to me, therefore, that the aim of the sanitary teacher should be to remove false ideas and notions from the minds of the people which relate to their health, and to urge them to accept what has been proven out in practical ways.

Empiricism is no longer a standard of action. The ideas of yesterday may not be the correct teaching for today, but until the results of the laboratory, as applied to sanitary management, have proven to be faultless, we cannot afford to be other than conservative in everything that relates to the public health, if we would retain the confidence of the people in our ability to serve them.

SANITARY INSPECTION—REMEDIAL AND CONSTRUCTIVE.*

By DR. OSCAR DOWLING,
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NEW ORLEANS, LA.

Not many years ago, the health officer was identified in the public mind solely with epidemics. In the intervals of immunity he dropped below the horizon line, to emerge only when the deadly foe again threatened. Today things are somewhat better. He has gained somewhat and is now associated in the community mind with epidemics and nuisances.

This attitude reveals the main activities of health boards before the day of preventive medicine.

*Read as address of Chairman of Section on Hygiene and Preventive Medicine, Southern Medical Association, Jacksonville, Fla., November 12-14, 1912.

With the evolution of the science of sanitation, the field of these public servants widened until now the purview of the health officer, to his mind, includes every phase of community life. To the average citizen this may seem only an attempt to gain power, but to the student of social well-being, it is a logical development.

Health as a fundamental in the individual life and the nation's progress and permanence, is a modern civic concept. Its relative value both as a personal and community asset, heretofore, was unthought of. Material resources dominated men's minds. That this philosophy is unwise and uneconomic, applied to life, is now beginning to be understood. Health is coming into its own as the most vital of all the elements that make for human development and happiness.

Naturally, it was the physicians who led in the enunciation of this principle. They alone know how essential physical vigor is; they alone comprehend the effects of disease upon the social body.

The more deeply the subject is studied, the more its ramifications are understood. Housing, child welfare, environments of the working class, especially women, food supply, are some of the primary elements of the social order in which health is basic. It is interwoven with the ethical and spirtiual advancement of a people equally with the physical. This is why, with increasing knowledge in science, the department of public health has enlarged its scope and activities.

In the light of the new interpretation of his duties, every intelligent health officer today is trying to find means of making concrete the discoveries which promise control or eradication of disease and betterment of conditions.

Your secretary suggested that I discuss ary Inspection as a Branch of Public ce. He also added that I ought to be able to write a crackerjack paper because of my experiences. I take it he would like to have a recital of incidents, but, apart from the setting, they lose in force and humor.

An old dairyman charged with making his milk supply elastic, said, "My cows have to wade through water up to their bellies every day. Of course the milk is thin." The humor of the situation was not in the old man's answer, but in his enjoyment of the fact that he had headed off the inspector with an entirely satisfactory explanation. The comment of another old-time citizen was interesting. On being told, "This hog pen outside your door is dirty and unhealthful. Don't you know that?" The reply was, "Why, Doctor, these hogs have been here four months and they ain't never been sick a minute." When directed to take a quarter of beef from his ice box and destroy it, the agitation of the old butcher, as he exclaimed, "My Gawd, man, I have call for dat meat. Dat meat, it sells, yes," cannot be given in words.

Usually the inspector is met in a friendly spirit but there are exceptions. For example, one butcher said, "I have been killing meat here for twenty years and the people say it is the best sold in this town. Who are you anyway, what do you know about this? Did you ever butcher anything?"

"If five hundred of you doctors and five hundred lawyers with you were killed off, we'd get along better, all of us," was one of the unfriendly speeches. I am frequently reminded by irate managers of eating establishments that the President of the Board of Health doesn't know anything, and especially that he doesn't know cleanliness when he sees it. Some few thrilling incidents relative to the use of a gun ended in warm and friendly assurances that compliance with the law would be evident within twenty-four hours.

Inspection at present is one of the best means of getting before the public primary facts pertaining to health. The purview of sanitary inspection includes all the fundamentals of community life, namely, water and food

supply, street cleaning, garbage collection and disposal, pollution of streams, sale of drugs, abatement of nuisances, conditions of public buildings, and the hygiene of industrial environments. From the nature of the work it touches vitally both the individual and the community. As a nation, we have failed to develop a system of inspection as a necessary adjunct to state and municipal administration. We lead the world in the development of the science of sanitary plumbing, but sanitary inspection with us is yet in its infancy. Its possibilities are not even apprehended.

Inspection poorly done were better left undone. If superficial, it provokes antagonism; if hastily or lightly done, it cheapens the entire health effort in the public mind. Persistence and system are essential and success depends largely upon effective routine work.

Attacking, as it does, things vital in community life, sanitary inspection brings an immediate return. A visit to over four hundred bakeries revealed the fact that one hundred and eighty-seven of the employes needed a bath and clean clothing. One of the men volunteered the information that he had not had a bath or change of linen for six days, but as that was Saturday "scrub night," my visit was not out of place. Reports of these inspections given to the press and sent to the proper authorities resulted in a general cleaning, and in a few instances permanent improvement. For a time at least, cleanliness of employes was emphasized. On the whole efforts of this kind may be considered superficial, yet they have a real value.

An order prohibiting the use of every slaughter house in a town of twenty-five thousand inhabitants seemed arbitrary. It worked a hardship on the people, as cold storage products, higher in price than home slaughtered meat, had to be purchased for a short time. But the result justified the measure as one entirely new slaughter pen was erected and all the others brought up to the standard required by the sanitary code. Adverse criticism was not lacking, but the agitation itself awakened the community.

Inspection of a thousand grocery stores in rural districts has eliminated from the shelves of these establishments and others of like character, harmful patent medicines. No feature of the state-wide inspection trip of 1910 in Louisiana was more productive of good than this special effort.

This phase of the work may be considered distinctly—if superficially—remedial. It is to be expected that many will do as little as they dare, not as much as they can. If two dogs and a cat sleep habitually in the market the permanent elimination of one dog becomes a cause for congratulation. If out of ten bakeries in a town, five are screened as a result of the inspector's visit, danger from flies is lessened just that much. Any improvement, however slight, becomes an object lesson if nothing more. Fortunately, there is satisfaction in the betterment of environments, for example, a restaurant owner in reply to a compliment from a traveling man said, "Yes, those *exceptors* cost me forty dollars, but my place, it looks fine, don't it?" He seemed to grow several inches both ways while he said it.

Inspection is a stimulus to community cooperation. To quote from an editorial in the progressive paper of a town severely criticised, "We are all mad. When we get madder we'll do something." After the inspector's visit the community eye sees trash piles, old cans, and debris on vacant lots. Later the community mind gets around to the notion of removal.

The remedial effect goes deeper in that it reaches out to the cooperative activities of the people. Cleaner stores make for better stores and supplies. Efforts to make sanitary an antiquated jail leads to the erection of a new building.

Inspection is not only remedial in effect; it is primarily educational. Practically these two elements are one; logically they are separate.

Giving opportunity as it does for specific

instruction on the subjects uppermost in the mind of the individual, inspection is an ideal mode of teaching. It touches a vital interest, with many the dominant interest of life—the business of making a living. In addition, the health officer is armed with the authority which compels obedience to his instructions. This makes the application of the principle a further training, and proves to the individual the usefulness of the knowledge imparted.

The printed score card for dairies is an example in point. The officer teaches, in his inspection, how to score every feature. Each one has a fixed value; to bring up the score certain things must be done otherwise the dairy will be closed. When improvements are complete the product is worth more, therefore, the value of the instruction is apparent in terms of dollars and cents.

If the evidence in eradication of disease were as clear there would be less apathy and indifference to hygienic instructions. But the danger of infection from impure water or unclean food or surroundings always seems remote and the origin of a contagious malady often doubtful. But it is worth while to risk criticism, even failure, to spread the gospel that dirt is a propagating agency in the transmission of disease.

In all health work, the hygienist is confronted with the crass ignorance of the masses in the simplest phases of healthful living. The conceded remedy is education, not just conviction as to the truth of the principle of sanitary science, but conviction vitalized into the habits of the individual and the activities of the community.

In principle, both psychologically and pedagogically, this form of hygienic work is perfectly adapted to raise health standards. Not in a day or a year, but ultimately.

In its educational aspect inspection is clearly constructive. It is a phase of prevention; it implies the elimination of conditions and practices injurious to health and the substitution of those which will conserve and develop all the potentialities of the human being.

To be effective this branch of health administration must, primarily, be fair, systematized, and authoritative. For success, justice to all, favor to none must be the cardinal principle of the policy. If friendship, influence, social position, political patronage bias the health inspector, happily, the work will fail. Criticism, impersonal, favorable when possible, adverse when needed, for all, with each case judged on its own merits, without comparison, is the only permissible line of action. From this it will be clear that only trained men of integrity, discretion, and force are fitted to be inspectors. The experience of two years covering more than four thousand inspections is convincing as to the qualifications of the men who should be employed in this work.

In this effort, as in no other, eternal vigilance is the price of success. Slipshod, haphazard, spasmodic attempts will not avail. Wise supervision with systematic management is necessary.

Authority is a determining factor in the efficiency of this phase of health administration. Prompt legal procedure against offenders is important and if the courts are not unbiased and sympathetic, the health officer, no matter how efficient, is powerless.

Lest your kindly patience be exhausted many arguments have been omitted and I fear I may not have made the strongest case for my client. But, from the results of conscientious, unremitting endeavor for three years, I am fully convinced that in the present state of the public mind toward health, inspection well done, affords more satisfactory returns than any other agency.

Perhaps you will pardon a last word. It relates to the public attitude toward the sanitary office, and the phase of the work he represents.

By whatever name the inspector may be known, he is looked upon by many as himself a "nuisance." He exposes insanitary

places and things which have been considered good enough for generations, and worst of all he insists on changes of a radical nature. It may be true that these improvements are in the interest of all citizens, but that doesn't "pay" for the trouble involved. Too often the sanitary inspector is looked upon merely as a foreman scavenger, a subordinate of the Medical Inspector. His part in the prevention of everything that will advance disease and retard the preservation of life is unknown, or unappreciated, by the majority, even by some who are members of local and state boards of health.

But this estimate is passing. The work of inspection is being recognized as of fundamental importance in the collection of facts which give a basis for the proper arrest of causes underlying the public's moral and physical health. Every branch of health activities, whether statistical, analytical or epidemiological, depends on the material gathered by this officer. The chemist and bacteriologist of the department, likewise, need his data for their conclusions; in fact, all researches in every field of sanitary science are dependent, more or less, on the facts gathered at first hand.

Intrinsically, inspection as a measure can be made the most useful agent of the health department in reducting to a definite surety many problems which have been hitherto complex and doubtful. But, let me repeat, the application must be made with a due sense of justice and a right notion of the scientific principle involved.

THE OPEN AIR TREATMENT OF PNEUMONIA.*

By J. D. HEACOCK, M.D.,
Birmingham, Ala.

To those of you who think most of enzymes, hormones, the nitrogen coefficient, etc., as well as those of you who are engaged principally with the technique of certain "ectomies" and "ostomies" and the management of ileus and "Lane's kink," this paper will no doubt sound like kindergarten talk.

However this may be, my only apology is for the incompleteness of the paper and not the subject matter.

The highest ideals of modern medicine, in my judgment, are embraced within the realm of preventive medicine and next to this, in point of appreciation and utility, should be "simple medicine." Under this term (my own coinage by the way) are embraced those principles and methods which utilize natural God-given agencies in a practical way. This idea, together with a temperate and judicial use of artificial agents is what constitutes the art of medicine. And a very beautiful art it is to ally the products of the labaratory as evolved by science with nature's own physical resources, thereby producing a harmonious expression which can be applied for the relief of afflicted humanity. Nothing could be more exalted or ideal, except perhaps the actual prevention of disease.

Happily the laity are beginning to appreciate and relish the use of simple measures in the treatment of their ailments. In fact, while not the rule, some place a higher value on simple hygienic measures than does the medical man.

Is not this a reflection upon the profession? Should we wonder that our patrons or *former patrons*, perhaps, consult the Ladies' Home Journal and other periodicals for advice? Or be chagrined to see intelligent people and valued lives committed to the care of professional trainers rather than the medical adviser? Reflect on the significance of a place like Muldoon's in New York State, an institution established, managed and owned by an ex-prize fighter, always, I am told, patronized to its capacity. What are the features that make this place attractive and successful? Why just simply *exercise, food, air,* and *sleep*. Of course we know the significance of these things, but their practical application from a

*Read before the Medical Association of the State of Alabama at Birmingham, April 16-19, 1912.

professional standpoint is where out shortcomings lie. It is wholly illogical and dishonest to minimize or treat indifferently the value of nature's fundamental life and health-giving elements. Our patients should be taught to avail themselves of these things rather than drugs. The doctor should be honest with himself and patients and utilize with precision and intelligence those agencies which come first hand from nature.

The employing of the use of the simple agencies in the prevention and management of diseases I trust will not in the least wise be construed as an intended disparagement of the scientific development and applications that have been placed before us.

The epoch-making work of Pasteur, Lister, Koch, Von Behring, Lazear, Stiles, Flexner and others has made clearer the value and importance of simple hygienic measures in the treatment and prevention of disease. The main point to be advanced in this paper is that fresh air is as beneficial to the sick as it is to the well and that it is more important that the former have a good full dose of well selected air than the latter.

Authorities on hygiene tell us that the greatest limit of life without oxygen is four minutes. We know that the fresher the air we get the more oxygen is furnished. We know that this main constitutent of air oxidizes, destroys and renders harmless organic impurities, and by oxygenating the blood and oxidizing the food for our tissues gives heat and energy, the vital source of all our thoughts and actions. Then if the condition in most all respiratory diseases is that of subjugation to some form of bacteria or toxine, does it not stand to reason that the remedy par excellence is that agent which contributes to the upbuilding and resisting power of the physical forces of the body?

To my mind there is only one other agency that could possibly surpass it and that would be some properly adapted sera. Within the next decade, no doubt, serum therapy will apply to all the respiratory diseases, as well as many others, and this together with an intelligent use of fresh air will evolve a treatment so scientific and effectual that we may be able to snap our fingers at them all. A question might be raised as to the selection and quantity of air allowed to the diseased. In the first place, physics teaches us that the composition of the air is the same wherever we go, provided no obstacle be interposed to the action of the material forces by which this uniformity is maintained. In other words, altitude plays a small part with the relative proportions of oxygen and carbon dioxide. Locality, however, affects the relative purity of the air on account of the exchange of these two elements, between animal and plant life. This necessitates the importance of an abundance of air where it is diluted or contaminated, in order that the requisite amount of oxygen may be obtained.

In a sick room of ordinary size the attendants usually exhale enough CO_2 to greatly affect the amount of oxygen the patient needs. This is especially the case if the inlet and outlet are small—the minimum size requisite for one healthy person being 24 square inches. Pastuer and Tyndall have demonstrated the axiomatic proposition that without dust there are no bacteria.

The best hygienists assert that any amount of CO_2 is harmless, provided the normal amount of O is in the air we breathe. Therefore the deduction may be made that with the dust feature eliminated we have here in Birmingham, and anywhere in Alabama, air that is sufficiently wholesome and curative.

The literature of today does not teem with reports and opinions on the fresh air treatment of pneumonia, but its advocates are gradually coming to the front, not with something new, but with an old remedy scientifically applied, and the results are reassuring.

All of us have every day object lessons of tuberculosis cases improved and restored, and it may be that in a short time the same

treatment will be as common and satisfactory in the other respiratory diseases—especially pneumonia.

Northrup, of Belleview Hospital, demonstrated the efficacy of the open air treatment for pneumonia so satisfactorily that that institution and a number of others have taken it up.

Dr. Frank S. Meara, Prof. of Therapeutics, Cornell University, is an avowed enthusiast on the subject. He reports a number of very sick patients who on being taken from the ward into the open air showed immediate improvement. He says "restlessness diminishes, the breathing becomes less labored, the quality of the pulse improves, and the whole picture changes." He has positive convictions that cold is no mean factor in the sum total of the benefits derived from the open air treatment.

Meara says, "in this open air treatment certain precautions must be carefully observed, more especially in cold weather. The bed is to be made in a particular way. Over the woven wire is to be spread a blanket large enough to extend well beyond the sides and below the foot. Over this a rubber sheet, or paper, and on these two is laid the hair mattress upon which the bed may be made in the usual way. Then the blanket and rubber sheet are folded up over the mattress and its cover from either side and from the foot and closed after the fashion of an envelope, being secured with pins. The blanket and impermeable sheet protect the patient from currents of cold air, sweeping up under the bed and working into the clothes. A hot water bottle should be kept at the feet. The amount of clothes should be enough to keep the patient warm, but not overheat him, and the material of the covers should be as light as possible, eider-down quilts for example, so that the burden of clothes shall not embarrass the respiration or cause fatigue by mere weight. The nurses should be clad for out-of-door weather."

The toxaemia of the pneumococcus infection is usually considered the chief factor in causing the symptoms of the disease, though it is now recognized that Friedlander's pneumobacillus is the exciting cause of a small proportion of the pneumonias, either lobar or lobular, and that in the pneumonia complicating typhoid fever bacillus typhosus may be found; and in septic pneumonia septic pyococci may alone be present.

Schottmeuller has reported five cases, clinically identical with lobar-pneumonia, from all of which he recovered streptococcus micosus, and Haistings and Niles have reported forty-three cases of pneumonia, lobar in type, from the sputum, of which pneumococci were not recovered by cultures. That lobar-pneumonia may be produced by a variety of micro-organisms other than the pneumococcus cannot be denied.

Of course, we all recognize the fact that lobular pneumonia is usually secondary, and the exciting cause may be either the pneumococcus of Frankel, Friedlander's baccillus, strepto, and staphylococci and the bacterial flora of the nose and mouth, or all of them.

LeFevre says, "the primary and essential action of the toxaemia of the pneumococcus infection is that of stimulation. Its effects upon the general nervous system is shown by restlessness and sleeplessness and in children by convulsions."

The respiratory symptoms that occur with the onset of the disease, the rapid, deep breathing, the using of the accessory muscles in both respiration and expiration, the fuller expansion of the thorax, etc., indicate that the entire respiratory mechanism is being stimulated. This toxic stimulation plus drug stimulation that is so generally used exhausts many cases before the crisis is reached.

A spell of pneumonia might be considered an endurance race against time. In this light does it not seem that the most rational thing to do would be to conserve the vital forces in a gentle and non-disturbing way? Fresh

air does this and cold fresh air does more. It has a soothing and regulating effect on the vaso-motor circulation.

Rauberg, in considering the effects on the circulation of pneumococcus infection says: "We must consider with the heart weakness, the weakness of the vaso-motors; with the cardiac paralysis that of the vaso-motor also." I am convinced that to the loss of vaso-motor control must be ascribed the chief danger in pneumonia.

There is as yet no specific for pneumonia, but as some author puts it "as we cannot cure our patient we must endeavor to keep him alive until he cures himself."

LeFevre disclaims that cold is an essential element of the open air treatment. He is an advocate of the open air method, but advises against the subjection of a beginning pneumonia patient to a temperature below 60 degrees F.

It is common knowledge and hardly merits comment, that such respiratory troubles as pharynigitis, laryngitis, bronchitis and asthma improve in open air, and with the exception of some forms of bronchitis do better in cold air.

Ullman, after carefully observing the influence of indoor and open air treatment found that on an average the intervals between paroxysms in whooping cough was three times as long under the open air treatment. However scant the literature on this particular subject, there is sufficient evidence to warrant the adoption of such method, subject, of course, to such modifications as are suggested in a given case.

There may be some terrific mental shocks on the part of members of the household at the suggestion of such treatment, but in a short time they will perhaps submit as resignedly as they now do to the ice pack which formerly was considered *"the limit."*

A THERAPEUTIC COMPARISON, MEDICINAL AND OTHERWISE, AS BETWEEN THE CAUCASIAN AND AFRO-AMERICAN.

By GEORGE M. NILES, M.D.,
Professor of Gastro-Enterology and Therapeutics, Atlanta School of Medicine, Atlanta, Ga.

When Kipling launched the phrase, "The white man's burden," it was accepted as an epigram with many sides and angles. It appealed to the Caucasian practically over the entire globe, for wherever the black-skinned people come in contact with their white brethren this burden has to be borne by the latter.

In the United States, especially in the Southern portion, an important part of the burden has been and is to conserve the health as well as treat the sick of the many Afro-Americans that fate has cast upon our shores, and who have become an integral part of our body politic.

I think it is accepted as a proven fact by all students of ethnology that any hybrid is more susceptible to the inroads of disease than a pure and unadulterated race. The Afro-Americans, in this connection, represent a hybrid of every varying shade, for few there are in whose veins course the unmixed blood of their African ancestors. We see them from the coal black on upward in the Caucasian scale until we find in every community negroes who could not be known as such by any outward appearance.

These people are with us to stay, and while some have attained positions of honor and trust, the majority belong to the laboring class. They till our fields; they cook our food; they launder our clothes; they nurse our babies; they serve in our hotels; they shave our faces; they drive our automobiles and perform multitudinous tasks of physical toil. Furthermore, they are our friends, and, as such, are entitled to consideration. This study is, therefore, submitted in their interest, being based upon more than a quarter of a century of active practice in the South, the first seven-

teen years being spent in an agricultural section where the industrial potentialities of these people caused their landlords and employers to exhibit an active concern in all that pertained to health. The later conclusions have been built upon observations gained in the gastro-intestinal clinic of the Atlanta School of Medicine, in which the negroes form probably 95 per cent of the clinical material.

I might say also that these conclusions apply only to quadroons and those of darker hue, the octoroons and those of almost pure Caucasian blood naturally partaking of the physical and mental characteristics of the whites, modified to a degree by education and environment.

The following are the approximate differences:

Cathartics—Probably in this class of agents lies the greatest difference. For instance, where two compound cathartic pills or twenty drops of fluid extract of cascara would produce free purgation in the Caucasian, this has to be increased about 50 per cent in the negro. Those practitioners who have had much experience with this race know well that an ordinary laxative produces no intestinal peristalsis whatever.

Emetics—The same rule as in cathartics applies where the emetic is taken in the stomach. When, however, emesis is to be brought about by action on the vomiting center, as by hypodermic injection of apomorphin, about 25 per cent less than the accustomed dose will answer.

Anodynes—I have observed that, while the negro easily gives way to pain, indulging in vociferous lamentations upon sometimes slight provocation, relief may be procured by about 30 per cent less anodyne drugs than are demanded by the Caucasian. I have often abated apparently severe colics by hypos of one-eighth to one-sixth grain of morphine, while this amount in the white race, as is well known, is inadequate except to "take the edge off" the pain.

Nerve Sedatives and Hypnotics—To these this race responds especially well. I have seldom found it necessary to administer the bromides in greater than five-grain doses, and ten grains of trional or five grains of veronal generally suffice in the infrequent cases of insomnia. "Tired nature's sweet restorer" is a boon rarely denied these care-free people, and "the raveled sleeve of care" is knit up with but little trouble.

Antipyretics—In these I have found no special differences between the races, though the aching pains accompanying fevers seem to be more quickly allayed by the coal tar antipyretics, and cyanosis seldom supervenes. In these so-called "bilious attacks," where intense headache and backache were present, I have seen the pains promptly yield to two-grain doses of acetanilid, considerably before the fever appreciably varied. This may be taken as a corollary to what has been previously adduced concerning anodynes.

Cardiac Stimulants and Depressants—My observations to date have led me to give slightly larger doses (probably 10 per cent) of both to the negroes. This statement I desire to fortify by further study.

Diuretics and Diaphoretics—About the same will apply as to the classes above mentioned, only I speak with more assurance. Those who have endeavored to set up satisfactory diuresis or diaphoresis in the negroes, especially the very black ones, will readily endorse my views.

Counter-Irritants—The epidermis of most Afro-Americans is rather thick, while the terminal sensory nerves do not appear to be normally impressionable, as a general rule. These agents, therefore, need to be used in considerable strength to produce satisfactory results. An active rubefacient that would make the average Caucasian deeply sympathize with the ancient Hebrew children in the fiery furnace would hardly produce an audible grunt if put on the unresponsive surface of a son of Ham.

Stomachics and Digestants—It is concerning these agents, perhaps, that I have the most satisfactory data. It might be well to state

in explanation that among the uneducated of both races it is customary to style as "stomach trouble" a disturbance located anywhere in the abdomen or pelvis. Among the men, aid is often sought for even a cystitis coupled with the self-made diagnosis of "stomach trouble," while among the female contingent most of the ovarian and uterine ills are referred to that long-suffering organ. For this reason we have seen in our gastro-intestinal clinic numerous negroes with supposed digestive disorders, where, in reality, the stomach was normal. As a test meal was taken in every instance, I am able to report on 128 cases where the stomach was apparently not the offending portion of the anatomy, and am constrained to the belief that the normal free hydrochloric acid in the Afro-American exceeds that in the Caucasian stomach by at least 6, probably 10 per cent. Acting on this assumption, I have given smaller doses of stomachics with good results, and as the oxyntic cells seem slightly more active, I have found hydrochloric acid indicated in a correspondingly less proportion. The alkalies, however, are often required. Very sparing doses of these aids to digestion have generally sufficed for the gastric infirmities of our negro patients—in fact, I have many times earnestly wished that some of the prompt and satisfactory responses shown by these humble invalids could be as easily duplicated among those higher in the social and financial scale—those to whom surcease from digestive discomforts would mean bountiful emoluments to the medical attendant.

Psychotherapy among the Afro-Americans is almost like planting good seed in virgin soil. Where the blase Caucasian "from Missouri" greets the earnest efforts of the psychotherapist with a "show me" air, the negro "hears the tidings gladly," cooperates to the extent of his ability, reaping a quick and bounteous harvest. To the tyro in psychotherapy this race presents unlimited possibilities for profitable experience, and I assure my confreres who have not appealed to the emotions and the somewhat primitively developed mentalities of these people in treating their ailments, that psychotherapy, in addition to indicated medicinal measures, will yield highly satisfactory effects.

The reader will, I trust, pardon the somewhat dogmatic tone of these statements, but as they represent conclusions not heretofore put in print, but which have been tried out to my satisfaction, I place them before the profession at their face value.

Should there be any doubting Thomases who would cavil rather than investigate, I would remind them of Hamlet's words: "There are more things in heaven and earth, Horatio, than are dreampt of in your philosophy."

920 Candler Building.

APPENDICITIS WITH LIME WATER AS A PROBABLE CAUSE.

By JOHN M. WILSON, M.D.,
MOBILE, ALA.
and
W. J. BLOUNT, M.D.,
HEALING SPRINGS, ALA.

Although I have never seen lime water mentioned by any authority as a probable cause of appendicitis, yet I feel sure that the evidence I have in these three cases is sufficient apology for offering this paper.

The patients in question were three brothers referred to me by Dr. W. J. Blount. I will say in the begining that the water used for drinking purposes by these patients is strong with lime. This family has used this water for drinking purposes for many years.

On May 7, 1911, one of the boys, about twenty years of age, was taken with acute appendicitis. He was immediately brought to Mobile for operation. During my absence from the city he was operated on by another surgeon, and much pus was found. The appendix was removed and free drainage was given this case. He made a good recovery.

The second case, about seventeen years of

age, was taken with acute appendicitis on June 5, 1912, presenting the usual symptoms of this disease, namely: fever, vomiting, etc. No time was lost in bringing him to Mobile, on account of the fear that his case might be as bad as the first one was. The patient arrived in Mobile about 6:30 P. M. and was immediately sent to the hospital and was operated on within an hour after he was placed in the hospital. His condition was extremely acute and showed symptoms of progressing sepsis. I did a McBurney operation. The appendix was very much inflamed and swollen and showed some symptoms of beginning gangrene. It was thought necessary to drain this case, which was done. The patient made an uneventful recovery, going home within two weeks following the operation.

The third case, about thirty-two years of age, had been suffering with gastro-intestinal symptoms several years, rendering him practically unfit for work or business. He would have occasional attacks of appendicular colic. In fact, he was sent to Mobile with an acute but slight attack of appendicitis for my examination about a month previous to his operation. This attack quickly subsided, and for various reasons I thought an operation inadvisable at this time. However, I kept him in the hospital for about a week to watch his condition. The patient improved rapidly and returned home apparently well. His gastro-intestinal symptoms soon recurred, and he developed a more or less chronic pain over McBurney's point. The patient again returned to Mobile and told me he had been unable to work, and asked for relief. I sent him to the hospital and operated two days later. The patient's temperature and pulse were normal at the time of operation, and, in fact, was in good health except for this nagging pain and more or less gastric symptoms. Under ether anesthesia I did a McBurney operation. The appendix and cecum were adhered to the peritoneum from former attacks of appendicitis. The appendix was very large and thickened, and contained six well formed calculi. The stump was inverted as usual and the wound closed without drainage. He made a complete recovery with no complications. I had a letter from the patient a few days ago, and he says he has no pain in his side and feels perfectly well. I had these calculi examined by Dr. Eugene Thames, whose report is attached below. These were shown to be composed of lime. As stated above, the drinking water used by the family consists largely of lime, and with the evidence given naturally leads me to think that this water is the probable cause of these cases of appendicitis.

Examination of the enteroliths by Dr. Eugene Thames of the School of Medicine, University of Alabama, showed that they contained carbonate of lime, also calcium and magnesium phosphate.

Book Reviews

A PRACTICAL MEDICAL DICTIONARY.

By Thomas Lathrop Stedman, A.M., M. D. (Editor "Twentieth Century Practice of Medicine;" Editor of the "Medical Record.") Second, Revised Edition, Illustrated. Over 1,000 pages. Price, $4.50 net, plain, $5.00 with Index. New York: William Wood & Co. 1912.

This monumental work well deserves the patronage which has so promptly demanded a second edition. It is well constructed, printed on thin India paper, has flexible Morocco covers, is finely illustrated where necessary, and above all, brings our rapidly growing medical vocabulary absolutely up to date.

The guides to pronunciation and pluralitv are efficient and the reference to the Greek or the origin of words is illuminating and useful. Stedman has given us a timely help just as our lexicons of five years ago were becoming hopelessly inadequate.

THE CARE OF THE INSANE AND HOSPITAL MANAGEMENT.

By Charles Whitney Page, M.D. W. M. Leonard, Publisher, Boston.

This little book of 155 pages deals with the subject in a practical, common-sense way. It suggests the proper qualifications for trustees, for superintendent and assistant physicians, speaks of the requirements of the laboratory, and in emphatic terms advocates "non-restraint." Other equally important details are dealt with. The author speaks with the voice of experience. For over fifteen years he was assistant physician to the Hartford Retreat, in Connecticut, and for seventeen years superintendent of the Danvers State Hospital, Danvers, Mass. The book is written in a pleasant, unostentatious style worthy of praise.

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Next Meeting, Lexington, Ky., October or November, 1913

EDITORIAL

"Clean Advertising," and a Compliment to The Journal

In an editorial in the number of January 4, the Journal of the A. M. A. uses the following language: "At this time of the year those physicians—and we believe they are in the majority—who believe the proprietary medicine evil to be a serious one, can do much to lessen it, if they will." The editorial then proceeds to show that the use of worthless or fraudulent proprietary medicines by physicians depends almost altogether on the "psychology of advertising."

If they were not advertised they would not be used. They will be barred from the pages of many medical journals if the subscribers and contributors will protest. Of course, this does not apply to journals that exist principally to boost the preparations of some one firm. When protests are made the publishers are able to reply that so few of their subscribers have objected to the publication of such advertisements that they believe their readers in general approve of their publication. Thus it is that the thousands of doctors all over the country who dislike to see their favorite journals disfigured by advertisements of fraudulent fakes, yet from indolence or modesty refrain from letting their objections be known to their publishers, unconsciously connive at the continuance of the scandal. Such, in a few words, is the trend of the editorial.

Farther on it says: "But so long as the medical profession will supinely tolerate this evil, so long will the evil exist. That an advertising policy which rejects nostrum advertising is not impossible of attainment in privately owned medical journals has been proved by at least three high-grade publications, the Cleveland Medical Journal, Cleveland, O.; the *Southern Medical Journal*, Mobile, Ala., and Surgery, Gynecology and Obstetrics, Chicago."

The *Journal* is gratified by the above recognition by the greatest medical journal pub-

lished in America, and also by being classed with the two standard journals mentioned. It agrees with the A. M. A. Journal that physicians generally should "register a protest against those other medical journals whose advertising policy is subversive to the best interest of scientific medicine, the medical profession itself and to the welfare of the public."

The Southern Medical Journal has found its crusade against unethical advertising an unprofitable and apparently thankless undertaking, because of the very conditions mentioned in the A. M. A. Journal, namely the apparent indifference of contributors and subscribers to the character of the advertisements adjoining their articles and defiling their literature. However, the *Journal* sees a gradual but steady increase in the support it is receiving, both in its growing subscription list and in the eminence of its contributors, some of whom have written words of encouragement along this very line. We believe victory is in sight and shall continue to push the fight for clean, honest, reliable advertisements intended as guides for physicians in selection of their remedies. No doctor shall, by any publication in our columns, be beguiled into imposing fraudulent preparations on his patients.

Fee-Splitting: Insidious Graft

We invite the attention of our readers to the correspondence published below, where will be found an instance of the most insidious possible form of fee-splitting. The physician who sent the inquiry is prominent in his state and was not conscious of the evil that lurked beneath the apparently innocent arrangement he described. The correspondence is genuine, and not imagined just to furnish an object lesson:

Editor Southern Medical Journal:

As a member of the Committee on Ethics of the American Medical Association, I want to detail a case to you and ask a personal reply to the same.

A physician of some years' hospital experience, and a graduate from one of the best schools in America, locates in a small town on the invitation of one member of the profession in said town. His desire is to do surgery. The man who invited him to come and take "pot luck" with the others has been doing surgery for several years. The new man comes, waits awhile, but does not get as much surgery as he likes. Then he goes to the neighboring towns, meets the physicians there and tells them he wants to do surgery, and will make it financially interesting to them if they will give him their surgery, allowing them to charge all fees and collect the same, and pay him whatever they think adequate.

He reports that he has been receiving, to the best of his knowledge, about one-third to one-half the fees charged. He never knows before he leaves home what he is to receive or expect. He simply trusts his finances to the family physician. I failed to state that he does all his surgery in the home of the patients, and the family physician assists in looking after the patient after the operation. The fee-splitting evil has never permeated this far away section, and if possible we would like to keep it out.

Do you consider the detailed case unethical?

Yours very truly,

Yes, Doctor, we consider it decidedly unethical.

Let us reason together. When a man perpetrates a wrong upon another or others, knowing all the time that he is in the wrong, the injury he does possibly ends with that one transaction. But when he does the wrong thing believing he is doing right, he opens a door to a troop of evils that will follow the trail he makes, and each succeeding breach of propriety will be more obnoxious than its predecessor. The better the man, the more mischief he has done.

No doubt the first zealot who proclaimed the doctrine that "the end justifies the means," or "evil may be done that good may come of it," sincerely intended to serve God, and save heretics by forcing them to realize the error of their ways and return to the true fold, be it Moslemism, Protestantism or Romanism.

Yet what orgies of oppression through fire and sword, cord and axe have shamed the face of heaven in the name of religion, because of the dogmas above expressed.

Doctor, only upon correct principle is it safe to found a faith or a custom that will guide

the actions of hundreds, to the betterment or detriment of thousands. In the instance submitted by you it is self-evident that all concerned were honest and well meaning, intending neither extortion nor bribery, yet the germ of all fee-splitting graft and its evils lurks beneath its innocent-looking exterior. It makes it profitable for the general practitioner to conclude that his patients need surgical treatment. It conceals from the patient the amounts of the respective fees he is expected to pay to doctor and surgeon. It is not impossible for the judgment of the physician to be biased in the selection of a surgeon by his own personal interests. Moreover, such practices could not long be concealed from the public and would cause it to lose respect for the medical profession at large, and to look with suspicion upon all its members.

It would undermine that confidence which should be the basis of all professional transactions between doctor and patron, for how could confidence remain when one believes there is a possibility that instead of the welfare of his loved ones being paramount in the mind of the physician, it is in reality only a matter of money? And would he not justly resent the sale of their chances to the highest bidder?

Again, one's fellow physicians and surgeons would, to a certain extent, become infected with the greed for unearned profits, and a disgusting scramble for assignments and commissions would give the final blow to that high estate which medicine, through generations of toil and sacrifice, has now attained.

The rock upon which our ethics must be founded is the Golden Rule.

Would you like it, Doctor, were a physician to select, to perform an operation upon your only son, the surgeon who would give him the most liberal divide? Certainly not. *Of course* it is unethical to do as our friend has been doing. *Every surgeon and every doctor must assess and collect his own fees. No money must go from either to the other without the full knowledge and approval of the patient or his representative.*

The Southern Medical Association at the Jacksonville meeting adopted resolutions regarding fee splitting that stamps its disapproval on any form of this insidious graft (see page 797, *Southern Medical Journal*, December, 1912).

Good Health and the Public Press

The most powerful agency in the world for rousing and directing the attention of the people to matters of importance is the newspaper press.

At its recent meeting at Jacksonville the Southern Medical Association, composed of leading physicians from almost every Southern State, considered the best means for rousing the public to a realization of the vital importance of general education in matters of public health. To this end they adopted the following resolutions, presented by Dr. A. W. Freeman, of Richmond:

"Whereas, The good health of the people is the most valuable asset of the nation; and

"Whereas; it is the highest privilege and duty of the public press to instruct the people in all matters pertaining to public welfare;

"Resolved by the Southern Medical Association in regular meeting assembled, That the newspaper press of both city and country is earnestly requested by the officers and members to cooperate with the Association in its efforts to educate the people in matters of hygiene and sanitation, to the end that thousands of valuable lives may every year be protected from disease and saved from untimely death.

"Resolved, That editors of newspapers and other periodicals published in the South, whether in town or country are urged to join this crusade against the foes of health, happiness and prosperity by publishing gratuitously such articles and documents as will, in their opinion, advance the cause, and by the still more effectual means of editorial advocacy.

"Resolved, That these resolutions be spread upon the minutes and that a copy thereof be mailed by the Secretary to every newspaper, magazine or other periodical within the geographical boundaries defining the limits of eligibility to membership in this Association."

Copies of these resolutions will be sent by the Secretary-Treasurer to all the periodicals, but this should by no means end the matter. It merely opens the doors to such communications as the doctors may see fit to supply for

publication. As a rule editors have but little idea of what should be said concerning these matters. After the usual commonplaces are exhausted, they are uncertain what further to say. The next step should be the introduction of this subject for discussion before every county medical society in the South. Each society should appoint certain of its members to write a communication to the county paper once a week, the members taking turns at the work and keeping the subject before the people for several successive weeks. This will remove from individual members all suspicion of self-advertising and at the same time afford them an opportunity to show the stuff they are made of. Where there are daily papers, the Sunday editions should be chosen. Editors will be glad to receive such communications. The reason they do not print more upon the subject is because it is not in the line of their studies. Doctor, this is not everybody's business, it is yours. Go to it. It will do your society and your community good, and it will not hurt *you*.

Causes of Relapses in Malaria

Attention is invited to an article in preceding pages entitled, "The Pathogenesis of Relapses in Malaria." It is from the pen of Bignami, probably the foremost authority in the world on all subjects related to malaria. It was translated for the Journal by the well-known Dr. W. M. James, of Ancon Hospital, in the Canal Zone, where every year many thousands of malarial patients are treated by medical servants of Uncle Sam, one of the most efficient of whom is Dr. James.

To the classical work of Marchiafava and Bignami the medical profession owes its first intelligent study of the Lavaran parasite, its pathological variations and their significance. Any journal has a right to feel proud when it is selected by such men as the medium through which to present to the profession a paper as important as the one above specified. It illuminates one of the most obscure phenomena pertaining to malaria, one of its most puzzling conditions, namely, that which seems to be absolutely unaffected by quinine, no matter when administered, or how, or in what sized doses. The puzzle is solved; the cause is known.

Southern Medical Journal Index

Beginning with the January number this Journal will prepare for the publication, next December, of a complete double index, embracing the titles of papers published of every description during the year, together with the names and addresses of their authors.

Slight changes are made in numbering the volumes, and in the numbers attached to the Journals, the object being to enable us to complete each volume with its December number. Other slight changes will be noticed by our readers, all of which. we hope, will add to the appearance and usefulness of the Journal.

Arrangements will be made to supply those who desire to preserve their Journals with substantial binders at moderate cost.

Concerning Cerebro Spinal Meningitis

Two important articles concerning cerebro-spinal meningitis appear in this number of the *Journal*, one by Dr. Charles C. Green, assistant health officer, Houston, Tex., the other by Dr. A. E. Thayer, professor of pathology in the School of Medicine of the University of Alabama. Both these gentlemen have had extensive experience in treating this dreadful disease in its present severe form, and the informattion they afford cannot be found in any text-book in existence.

Our views of the treatment of cerebro-spinal meningitis have not yet reached the stage of record in standard works of a permanent character. The day has passed when a physician can rely upon his library alone, however ample to keep his posted concerning the accepted views of diseases and their treatment. He can rely for such information only upon

standard periodical medical journals, magazines that are free from the control of mercantile interests of any character.

The editor feels justified in naming this *Journal* as one of that class.

In this connection attention is also invited to another article in this number, one writen by the famous Bignami of which mention is made in another editorial. Indeed the *Southern Medical Journal* presents to its readers in this issue articles by authors of whom any publication should be proud.

Artificial Pneumo-Thorax

Dr. Edward Otis Brown, of Boston, publishes in the Boston Medical and Surgical Journal, October 31, 1912, an article on "Artificial Pneumo-thorax in Advanced Cases of Unilateral Pulmonary Tuberculosis." The paper is remarkable only for its omissions. It glaringly ignores the work of any and all American physicians and surgeons who have done so much to render the procedure safe and practicable. A reader unfamiliar with the facts would infer that only to European surgeons was any credit due in the matter.

He informs us that in a recent visit to Europe he was impressed with the favorable results of the operation "and the confidence" in it manifested "by the physicians who had experience with it." He touches lightly upon seeing Forlanni, in Pavia, and Bauer and Deneke, in Hamburg, and allots honorable mention to Saugmann, of Denmark. To one American he renders praise, as follows: "Artificial pneumo-thorax is now being done in this country and the thanks of the profession are due to Dr. J. H. Pratt for first introducing it in this community in 1909, and to Drs. Robinson, Floyd and Balboni for further popularizing the operation."

As a "card sharp" would say: How is that for high! Not a word of Dr. T. B. Murphy's great "Oration on Surgery" before the American Medical Association in 1898, which was devoted to a masterly consideration of this operation; no mention of Temke's article in the A. M. A. Journal in 1899. As for papers on this operation written by Southern authors, not a word from Dr. Brown. Therefore, it is not so remarkable that the work being done by Dr. Mary Lapham in Noth Carolina, her several articles, and particularly her complete, illustrated exposition of the "Technic for Compression of the Lung in Pulmonary Tuberculosis," that appeared in The Southern Medical Journal for February, 1912, escaped his knowledge. Why should he notice work done in Dixie? "Can any good thing come out of Nazareth?" The evident unfairness of such an article as that of Dr. Edward Otis Brown must be caused by either ignorance or perversity.

In either case it violates the broad catholicity of medicine, which knows no section but *civilization*, no community but *humanity*, no watchword but *service*, and speaks only when it has a message to deliver. Silence would have been the proper attention for it to receive, but its countenance was so smugly self-satisfied that it cried for a brickbat.

Distilled Water Unsafe Unless Boiled

At the Pasteur Institute, in Paris, M. A. Trillat has investigated the condition of air and water that render them favorable to the growth of pathogenic organisms. Two facts, important to pathology, were demonstrated. First, that though air which was contaminated by foul effluvia might not contain any more microbes than that not thus affected, yet the microbes that *did* exist therein became more virulent in character.

A more important conclusion, from a practical point of view, is that distilled water containing only "one-five-millionth of its weight of putrid gas acted as culture medium like bouillon."

The lesson is, then, that distilled water, to be safe as a vehicle for subcutaneous or intravenous medication, must be either freshly distilled or carefully reboiled before using, if absolute safety is required.

THERAPEUTICS.

IRON AND HEMATICS.

The desire to "purify the blood," to "build up the blood," to "increase the haemoglobin" and so on has prevailed for many generations among both the laity, who believe in "brimstone and molasses," or "rusty nails in vinegar" as regular springtime medication, and the regular physician who prescribes potassium iodide for the spirochaete and hematics for all forms of anemia. Like most public beliefs that have been widely accepted and long maintained, this faith is founded upon a dim conception of important truths. *Hematics* are agents that exert an influence upon the condition of the blood. Closely allied to these, and in some instances identical with them, are *tonics*, agents that tend to increase the general organ over which they also are supposed to exert an influence.

FERRUM (IRON).

Iron and its preparations stands at the head of hematic drugs. It is an indispensable element in the composition of the red blood corpuscles, where it is supposed to act as an oxygen carrier, conveying that vital element to the various tissues and returning to the lungs laden with carbonic acid gas resulting from necessary disintegration of tissues in performing their physiological functions. It follows that whenever the erythrocytes are far below the standard in numbers the work of the system is performed with difficulty "because the laborers are few."

Experience has shown many generations of physicians that the proper administration of some preparation of iron is the most useful therapeutic procedure at their command. The high estimate placed upon iron is shown by the large number of official and unofficial preparattions of it available for prescription, the entire number being over fifty. Of these no less than twenty are in general use, either by themselves or in combination with other drugs.

It should be remembered that no fluid preparation of iron should be prescribed in the same mixture with tannin, or any vegetable substance containing tannin, on account of the repulsive looking black compound resulting, to say nothing of its taste. In fact, iron and tannin mixed form good black ink. The solid forms of iron used in medicine will be first considered.

FERRUM REDACTUM.

Reduced iron, iron by hydrogen and Quevenne's iron are the names for this preparation. It is found in the shops in a fine, gray-black powder, without taste or odor, and insoluble in water or alcohol. When taken in small doses, 2 grains after each meal (0.12 gm.) it causes no symptoms of immediate results, but after a few days of such treatment; that is, if the subject is a suitable one for its use, the patient begins to have a better appetite and feel more inclined to moderate exercise.

The lips, which were pale, and the mucous membranes of the mouth, regain their pink color. The bowels are sometimes more and sometimes less regular than before, but the stools have assumed a greenish-black color caused by the excretion of unabsorbed iron combined with tannin and sulphides. In a word, the whole system seems to have received a tonic impulse. No direct effect upon the pulse is evident, but the respiratory powers are increased, or, as some patients express it, "their wind is better."

Reduced iron is supposed to be changed in the stomach into chloride before absorption, and this is probably true of all the solid forms usually prescribed. Nevertheless, experience teaches that there is much difference in the efficiency of the various irons. Some practitioners prefer to give minute doses at intervals of one hour, and in this way claim to use less iron with greater effect than in any other. For such uses the dose of reduced iron

is 1-8 grain (0.008 gm.). This preparation is one of the bland, or unirritating irons. Others which are likewise free from irritating qualities are the Pyrophosphate of Iron, dose grains 2 to 5 (0.12-0.3 gm.); Ferri Citras, same dose; Ferri Hypophosphis, slightly soluble in water, dose the same; Ferri Lactas, dose 1 to 3 grains (0.6-0.19 gm.); all the carbonates, dose 2 to 5 grains (0.12-0.32 gm.), and most of the so-called organic compounds of iron.

The iron salts of the mineral acids are generally styptic and irritating in character. Ferri Pyrophosphas and Ferri et Potassii Tartaras are probably the least irritating and most assimilable of the milder salts, being readily soluble in water and easily disguised in taste by a little syrupus Limonis, or other flavoring. The Ferri Albuminas, or albuminate of iron, containing 5 per cent of metallic iron, is unirritating and readily absorbed. One of the most elegant of the official preparations is: Elixir Ferri, quininae et Strychinae Phosphatis, containing one grain (0.06 gm.) of phosphate of iron, 1-2 grain (0.03 gm.) of quinine and 1-64 grain of strychnine phosphate (0.001 gm.) to the tablespoonful 4.0 c.c. Many of the highly advertised iron tonics are merely equivalents of this useful elixir. Not one of them is superior to it in elegance or efficiency.

Many preparations of iron derived from the blood of animals are offered to the profession as superior to those of chemical origin, but investigation has not yet determined their true value, many investigators considering them inferior to some of the older and less pretentious preparations.

Externally and locally iron is used as a hemostatic. For this purpose the subsulphate or its solution, is the most useful, though the chloride and nitrate are also available. These salts form with the blood a hard, insoluble clot, which is disagreeable and liable to infection. They should only be used in emergencies where ligation or pressure are not immediately available.

A dilution of the tincture of the chloride, one part to seven of water, has been used as an astringent spray in chronic pharyngitis.

In most forms of anemia iron is of great benefit, but in pernicious anemia, unless the cause be found and remedied, it is useless

In chlorosis Blaud's pills, each containing one grain of carbonate of iron (0.06 gm.) are found most effectual, from 2 to 4 being taken three times a day. In the anemia of Bright's disease the Liquor Ferri et Ammonii Acetatis, solution of iron and acetate of ammonia, is by far the most useful form of hematic to administer. The average dose is 2 fluid drachms (8.0 c.c), well diluted, four times a day.

Syrupus Ferri Iodidi, syrup of iodide of iron, has been found useful in anemia of scrofula and syphilis, and in removing a tendency to boils. It is a mild preparation and properly diluted is suitable for children. When their cuts and sores are slow to heal, or there is a tendency to spreading in any skin lesion, 3 drops (0.19 c.c) in teaspoonful of sweetened water can be given with advantage every four hours to children between two and eight years old. As an alterative tonic to adults it can be given combined with iodide of potash, ten drops to ten grains (0.64 c.c. and gm.), in a dessertspoonful of water after each meal.

In recurrent chills a tonic of the tincture of the chloride, three parts, and solution of potassium arsenite (Fowler's solution), one part, is of great advantage, taken in doses of 15 drops (1.0 c.c), well diluted, three or four times a day. Saturation by the arsenic should be avoided. The tincture of ferric chloride has also been thought useful in diphtheria and erysipelas, the dose being from 3 to 15 drops, well diluted, according to age. The addition of small doses of some preparation of mercury certainly seems to increase the efficiency of an iron tonic. The following prescription

has long been a favorite with the writer:

℞—Sol Ferri Albuminatis f. .....℥ viii.
Hydrar, Bichlor. .....gr. s.s.
Strychninae Mur. .....gr. s.s.

Sig. Tonic. Dose, two teasponfuls after each meal.

This prescripiton does not stain the teeth. Generally preparations of iron should be taken only upon a full stomach and the teeth protected from injury. The medicine should be sucked through a glass tube and the mouth then rinsed with a weak solution of common cooking soda ready for the purpose.

If constipation results from the iron it should be combated with vegetable purgatives, such as compound extract of colocyinth and other mixtures, especially those containing aloes or aloin.

CORRESPONDENCE

AN ERROR IN THE DISCUSSION ON SYPHILIS.

HOT SPRINGS, ARK., Jan. 15. 1913.

Editor Southern Medical Journals

I note on page 34 of the January number of The Southern Medical Journal I am quoted as saying: "It is always at or about the third year during the course of the disease in which we get our general paralysis of the insane, and locomotor ataxias, etc." I am sure you will be kind enough to correct this statement, because it is an error. It should be 'at or about the tenth year," and not the third or fourth, as stated above. I would appreciate it if this note could be made, in order that I may not be misquoted.

Thanking you very much in advance, I beg to remain,

Sincerely yours,
C. TRAVIS DRENNEN.

Editor Southern Medical Journal:

I write to ask you to publish my experience in a method of vaccination against smallpox which I have not yet seen mentioned in any publication. I have reference to the direct introduction deeply into the tissues of the virus instead of the introduction by the slow process of inserting into the skin and allowing its absorption in the usual slow process by the incubation period.

In 1902 I was called to see several cases of fever and found a case of smallpox in an adjoining room in the stage of desquamation, he having gone through all the various stages of the disease without calling a physician. There were three patients with the prodromic fever, having the usual headache, backache and other symptoms of the febrile stage.

I had some fresh Mulford's glycerinatized virus that I had just received direct, and I concluded to make a trial of both methods in these cases. I vaccinated a woman thirty-one years of age and a man about thirty-five years of age deeply into the muscles of the arm with the virus, after blowing it out with the small rubber bulb on the end of the tube, previously breaking the tube in the usual way, and diluting virus with sterilized water. The other patient was vaccinated in the usual way.

The first two cases received a great deal of relief from the febrile symptoms at once, and the other case broke out with a typical case of almost confluent smallpox on the fifth day after my seeing them. The case vaccinated by deep injection had only about fifteen or twenty varioloid bumps on the body.

I have often thought I would report my experience along this line, but considered the cases too few to be depended on for a satisfactory conclusion.

This season I have had occasion to try out these different methods in a few more cases.

I saw a case of smallpox in a family in an isolated country home October 7 last and did not, at the time, know that the patient had a smallpox fever, but on about the sixth day after I first saw him he was breaking out with a typical smallpox eruption. I at once vaccinated the brother of the patient and a nephew also, as well as a niece by marriage; also a sister-in-law. These were all vaccinated in the usual way and after waiting four days, the brother of the patient got the City Health Officer to revaccinate him. tion had taken on the fourth day I concluded to use the vaccination by hypodermic method. Twenty-four hours later both had febrile symptoms and broke out with varioloid. The wife of the patient's brother had a good scar of a recent vaccination and was revaccinated by me and by her husband and missed the infection entirely, but her husband, the borther of the first case, after nursing his son while the son had varioloid (his vaccination not showing any or very little results) broke out with a serious case of smallpox.

I believe if I had treated him as I did the children, he would also have missed the disease. I now feel convinced that this is the correct method of creating immunity to smallpox, and as it is not so objectionable as the other method, being careful in preventing infections by other germs, it is the safest method also.

There is no local sore or wound produced and by telling the patient there will not be the usual sore on the arm, it will not be objected to.

I shall vaccinate this way in the future and will do what I can to do away with the terrors that have followed the old method of vaccination.

It looks reasonable to my mind that it should be the correct way of creating immunity and thereby protecting the poor fellow that is in dread of one of the most loathsome of all diseases.

I used the glycerinated vaccine with ivory points

put up by Parke, Davis & Co., of Detroit, Mich. Another family who were exposed to the children while they were sick with the fever had varioloid were vaccinated in the usual way with the same virus, but there was no response and all who were exposed had serious cases of smallpox, as there was no response to the vaccination.

There were no local effects produced in either case, as I introduced the needle deeply into the posterior portion of the arm and covered the point of entrance and exit of the needle with cotton and collodion and covered with sterile gauze and adhesive plaster to hold the dressings.

The main point of advantage in this method is the immediate effect produced and the protection it affords in all cases of exposure; the second advantage is the avoidance of local sores and the danger of other infection. I shall be glad to hear from anyone else who has had any experience along this line.

I believe the houses who are manufacturing vaccines should use small syringes of glass as in other anti-toxines. I do not fear the results. I wrote Mulford and Parke, Davis & Co. several years ago (1898), when I had the first experience, and suggested that they send me some vaccine prepared in this manner or send me some lymph in bulk and let me experiment with it in this form, but had no reply. I spoke to the agent of Parke, Davis & Co. recently and had a letter from his company which I have not at hand now, but their experience seems to be againt this method of vaccination. I believe it was due to injecting it too superficially under the skin if there were untoward symptoms. I shall use any opportunity to try this method again and shall be glad if my friends and fellow physicians will try out these methods. If it be successful as a substitute for the old method there will be a great revolution in smallpox prevention.

The foregoing letter is from a well known physician, Dr. I. H. C. Cook, of Hattiesburg, Mississippi. His experience is of great interest and demands consideration. As was intimated to him by Parke, Davis & Co., past experience with this method of using vaccine has led to unfavorable conclusions. The writer cannot at the present moment recall the time or place where the plan of using the virus hypodermically was tried, but is under the impression that it was in the United States army, under direction of army doctors. The results were so very unfavorable that the experiment was soon dropped. However, several conditions may have since changed. The virus may be more aseptic, or the point for depositing it, subcutaneously or intramuscularly, may have caused different forms of reaction. It is worth looking into. The failures met when the standard method was used may have been because the virus was not sufficiently rubbed into the abrasion.

ABSTRACTS AND COMMENTS.

AMOEBOID DYSENTERY.

W. E. Deeks, M.A., M.D., Chief of Medical Clinic, Ancon Hospital, Canal Zone, publishes in the A. M. A. Journal of January 4 an important paper on Amoebiod Dysentery, especially the form arising from infection with the *Entamoeba Histolytica.*

The article is of considerable length and quite exhaustive, but this Journal can, at the present, reproduce only the few paragraphs relating to treatment. Though brief, they constitute the most important part of the paper, from a practical standpoint. He says:

"A variety of methods have been tried in this hospital with varying success. They resolve themselves into oral medications and local treatment in the form of irrigations. Among the former may be mentioned castor oil, magnesium sulphate, opiates, ipecac, and bismuth and opium; among the latter, quinin irrigations in varying strengths, but usually 1 to 500, thymol irrigations 1 to 2,000 or 3,000, combinations of them, silver nitrate 0.25 per cent, boric acid, starch and laudanum, tannic acid, copper sulphate, normal salt solution and plain water, warm and cold.

Of all the different methods used, one stands out preeminently; that is, bismuth by the mouth, and simple irrigations, either normal saline or plain water per rectum. The method is simple, harmless and physiologic, and, as our statistics show, more than justifiable. Absolute rest is enjoined, an absolute milk diet, of which there should be an abundance, saline or water irrigations and bismuth subnitrate in heroic doses. We do not object at the beginning, if tenesmus and distress be very severe, to an occasional hypodermic of morphin and atropin, but as a routine measure it is not considered good treatment."

In the British Medical Journal for December 14, 1912, appears an article entitled:

"AN INTRACELLULAR PARASITE DEVELOPING INTO SPIROCHAETES. Found by the Jelly Method of in Vitro Staining in Syphilitic Lesions, and in the Circulating Blood During the Secondary Stages of the Disease. By Edward Halford Ross (The McFadden Researches). The Lister Institute."

The article, which is finely illustrated in colors, shows that certain numerous round or pear-shaped bodies, included in the large mononuclear leucocytes and also lying free between the blood corpuscles, are readily discernible.

These small bodies "become included within the cytoplasm of the leucocytes, epithelial and other cells. Here they encyst themselves in a cell wall, grow, and their chromatin undergoes division and subdivision.

These included bodies are frequently seen in the depths of the chancres, glands and sores."

He further states that in some instances this intruder, when fully grown, gives rise to several "curled and twisted spirochaete-like tails (many of them closely resembling 'Spirochaeta pallida'"). Further developments of the article fully demonstrate the identity of these chromatin bodies with one phase of the development of the acknowledged germ of syphilis.

In order to cultivate this parasite a certain jelly is necessary for the culture medium. "The Technic of the Jelly Method" is given by our author in full.

Three c.cm of a 2 per cent solution of agar in water, boiled and filtered.

One c. cm. of Unna's polychrome methylene blue (Grubler), which has previously been diluted with 2 c.cm. of water; and 2 c.cm of a solution containing 4.5 per cent sodium citrate, 1.5 per cent sodium chloride, and 0.225 per cent atropine sulphate.

Boil in a test tube and add 0.3 c.cm. of a 5 per cent solution of sodium bicarbonate.

One drop of this mixture while still fluid is dropped on a microscopic slide and allowed to spread thereon, to cool and to set.

Prick the chancre with a large needle, squeeze the blood from it so as to obtain the deeply-seated cells. One drop of this blood is then placed on a cover glass and inverted on the jelly. In five minutes examine.

"The granules of the leucocytes stain scarlet, while the cells themselves are still motile; then as the nuclei stain, at first a pale blue, but later a deep ruby red, the motlity ceases, for the cells die." "If the patient has received treatment, such as an injection of '606,' or mercury, the free parasites are reduced in numbers, apparently within a few hours," whereas the forms included in other cells remain as before. Thus far this parasite has been found only in cases of syphilis. A curious suggestion is offered by the author.

It seems that these, or apparently identical parasites, are found in the blood and tissues of guinea pigs and rabbits, producing white patches in the liver and spleen, very much like the gumma of syphilis. He suggests that the parasites found in guinea pigs or rabbits "might produce in man a mild affection which would modify the human disease of syphilis in the same way as the vaccination of cowpox has modified smallpox in the individual and the community."

There seems to be an analogy or similarity between the conditions characteristic of the two diseases that might warrant some experimentation.

The benefits, if any resulted, would be simply stupendous in their effect upon human society.

A Case of Blackwater Fever Followed by a Peculiar Relapse Without Hemoglobinuria or Detectable Plasmodia. Major R. Ross D. Thompson and G. C. E. Simpson. Annals of Trop. Med. and Hyg. Vol IV, No. 3, December, 1910.

The authors report the case of a European trader who had suffered for some time with recurring attacks of malaria. He was admitted on June 1, 1910, with a well defined estivo-autumnal infection, of 3,600 parasites per c. mm. On the fourth day after admission, quinine hydrochloride in doses of thirty grains daily was begun. The fever stopped promptly, and on the seventh and eighth days he was allowed to go out. On the eighth day he became heated through exercise and ate ices. On the ninth day he was attacked by a high fever, with chills. Hemoglobinuria began on the morning of the tenth day and continued until the evening of the eleventh day, when urine cleared. The fever gradually fell until the eighteenth day, after which there were slight rises above normal until th thirty-seventh day.

On the forty-second day there was another febrile attack, very similar to that accompanying the previous blackwater, but without either blackwater or parasites. The temperature was markedly remittent, and chills were present. This continued until the fifty-fourth day, after which the patient improved greatly and was discharged on the sixty-third day.

What makes this report of interest is that it is probably the first case of blackwater in which from start to finish very careful numerical estimations of importance have been made. The *Plasmodia* were not found after the sixth day; that is, after two days' treatment with quinine. No crescents were found at any time. There was a fall of hemoglobin from 85 per cent to 70 per cent during the malarial attack, and on the sixth and seventh days a rise to 75 per cent. What followed is very instructive. On the eighth day, before the onset of the hemoglobinuria, the hemoglobin fell 10 per cent, 10 per cent more on the ninth day, that before the onset of blackwater, and continued to fall until the fourteenth day, three days after the urine had cleared, when it was only 25 per cent. It remained at this figure for three days, when it rose slowly until it reached 90 per cent on the fortieth day. During the second febrile relapse, which began on the forty-second day, the hemoglobin fell only 12 per cent. The erythrocytes fell from 2,600,000 on the eleventh day to 800,000 on the fourteenth day, and on the twenty-ninth day there were 2,800,000.

There was only a slight rise in the urobilin in the urinary secretion during the first febrile period, a maximum of 64 mgms. being recorded, while two examinations of the fecal secretion showed a total of 1,836 mgms. 'Commencing from the tenth day the feces were examined continuously, and disclosed a urobilin excretion of 32,500 mgms. during six days, falling after this to the low figure of 100 mgms. per day." While the blackwater lasted there was a marked increase in the urinary urobilin, 340 mgms. on the tenth day, 300 mgms. on the eleventh day, and 115 mgms. on the twelfth day, after which it fell to the low figure of 30 to 60 mgms. per day. "In all, the hemoglobin of 17 c.c. of normal blood, or 2.5 grams of hemoglobin, was passed by the urine," a very much small quantity than by the feces. The urinary chlorides were markedly diminished during the blackwater period.

The authors call attention to the fact that "the total elimination of urobilin from the eighth to the fifteenth day represents an amount of hemoglobin equal to that of *all* the patient's corpuscles, the 25 per cent of hemoglobin still remaining being probably contained in the young corpuscles generated during the period referred to." This fact, as they note, is in accord with Panse's law, that when malarial parasites are present at the onset of an attack of blackwater, they rapidly disappear, because they cannot live outside of the erythrocytes, and when these are destroyed, the parasites must perish.

This observation has also been confirmed by Deeks and James in their report on Hemoglobinuric Fever in the Canal Zone. Also it has been noted repeatedly at autopsy that even when very large numbers of asexual parasites were present at the onset of blackwater, nearly all would disappear in as little while as forty-eight hours, although not over half of the erythrocytes had been destroyed. This phenomenon is probably due to the destruction of those erythrocytes which contain the *Plasmodia*, on account of the lowered resistance of the former before the uninfected, and therefore more resistant, erythrocytes perish.

The authors are not inclined to believe that the fever of blackwater is due to toxin generated by the parasites themselves, for in this case it is clearly shown that there were not enough parasites present at the beginning of the hemoglobinuria to cause even an ordinary malarial paroxysm. Also, the fever differed in type from that of the usual malarial paroxysm, and was much more severe. Whatever the cause is, as they note, it exerts a powerful hemolytic as well as pyrogenous effect. The authors state that they do not know of other cases in which there was a febrile relapse without parasites or hemoblobinuria being found. There are, however, several such cases reported by Deeks and James, and "post-hemoglobinuric fever," which may either continue after the blackwater has disappeared, or may set up after a period of apyrexia (as in this case), is a matter of common knowledge among those who have seen much hemoglobinuric fever.

The authors attribute the appearance of the hemoglobinuria to the failure of the liver to deal with the amount of hemoglobin freed by the hemolytic agent. Unfortunately, the amount of urobilin excreted by the feces was not estimated in the third febrile period. They also hold an interesting opinion as to this third febrile period.

"The third pyrexial period is of great interest, because it appears to establish a new fact, namely, that this peculiar fever, though generally associated with a great fall of hemoglobin and also with hemoglobinaria, need not necessarily be associated with either (the *Plasmodia* being at the same time undetectable). This proves that mere hemoglobinuria by itself does not cause the fever."

That hemoglobinuria itself is not in relation to the amount of pyrexia is a well known fact. More than one very severe and fatal case of blackwater fever begins with a slight chill, after which the temperature falls to normal or subnormal, and the hemoglobinuria continues for some time, or until death. On the other hand, very marked febrile disturbance not seldom follows the passing of a very small amount of colored urine, and continue long after the urine has become clear. The reviewer has witnessed a "post-hemoglobinuric fever" that ran a course almost exactly like that of typhoid fever for four weeks, and that did not begin until a week after the passage of a very small amount of blackwater, with but little febrile and bodily disturbance.

The authors believe that this post-hemoglobinuric fever is caused by the same agent that produces the more severe hemoglobinuric fever, but that hemoglobinuria will not manifest itself unless the liver fails to take care of the increased amount of hemoglobin. It does not appear, from the observations to which the reviewer has access, that in similar cases there has been any decrease in the erythrocytes other than that which usually occurs in a severe febrile disturbance.

The report is, however, none the less instructive by reason of the care with which the observations were made. If similar work could be done by those who have access to a considerable number of cases of blackwater fever, we might get nearer to the true cause of one of the most obscure problems in tropical pathology—the exact mechanism of the hemolysis that occurs in this most peculiar disease.

W. M. JAMES.

LA MALADIE GELATINEUSE DU PERITOINE D'ORIGINE APPENDICULAIRE. F. Lejars in the Semaine Medicale, December 11, 1912.

The author throws light on the abdominal "myxomata" sometimes met with in intra-abdominal operations. He has had three cases and others have been reported of supposed colloid cancers—masses of jelly-like material arising from the appendicular region. The reports of several other cases by different authors confirm the harmlessness of this condition. His case was a man, age 45, who had a post-operative fistula following an operation for appendicitis. A jelly-like discharge associated with a tumor in this region demanded operation. Two handfuls of this jelly were evacuated and the consequent recovery showed this to be merely a pseudomyxoma of appendicular origin, and not, as was thought at operation, a colloid cancer.

C. M. REMSEN.

INTESTINALERSCHEINUNGEN BEI BASEDOWSCHER KRANKHEIT UND SCUWIERIGKEITEN DER DIAGNOSE. K. Kolb in Munchener Medizinische Wochenschrift, December, 1912.

What is emphasized in this article is the importance of understanding that the intestinal disorders in exophthalmic goitre may be far more pronounced than any of the other symptoms and that one should in the event of chronic intestinal disorders look for even the faintest signs of Grave's disease as a cause where the more common causes have been ruled out. Kolb's case was a man of 45, who had had goitre for 18 years and a diarrhoea for 15 years which was in no way amenable to treatment. Thyroidectomy almost immediately cured this patient. Such cases are in no way infrequent, but one must realize the importance in cases where the exophthalmic symptoms are sparse of carefully searching for any symptoms of this disease, and it is probable that not a few intestinal cases will be cleared up in this manner when one searches for a general cause rather than entirely limiting one's self to local intestinal conditions.

C. M. REMSEN.

DE LA PERIHEPATITE BILEUSE AVEC EPANCHMENT BILIARE DANS LE PERITOINE SANS PERFORATION DE L'APPAREIL BILIARE. Sven Johansson in Revue de Chirurgie, January, 1913.

The author reports a case coming to operation—female, 76; acute abdominal pain; diagnosis, appendicitis—which showed free bile in the peritoneal cavity and an apparently intact bile tract. Death on the sixteenth day confirmed this supposition by careful autopsy. A catarrhal cholecystitis with hemorrhages in the wall was seen microscopically. Several other similar cases have been reported lately. Clairmont and Haberer are "forced to sup-

pose a pathological condition exists in the wall of the gall bladder and ducts consisting on an increased permeability of the walls not visible microscopically." Johansson suggests the possibility of lymphatic infiltration showing the close relationship of the abdominal cavity to the lymph tract. The permeability of the bile tract to bile a few hours after death is mentioned as possibly bearing on this condition, while the frequency with which Eberth's b. permeates the vesical wall strengthens the possibility of the bile acting similarly. Schievelbein thinks the Canals of Luschka—eversions of mucosa which ramify and traverse the interstices of the vessels through the muscular tissue to the subserous tissue up to the peritoneum—are determining factors in this process. Experimental ligature of the common duct will cause some bile to appear in the peritoneal cavity, but this presupposes a perfectly normal gall bladder, which is rarely seen with calculi in the human. Finally it is suggested that there are chemical changes in the bile which increase the permeabiilty. Whole question still an enigma, but it is possible that with the appearance of more cases the etilogy will be cleared up. C. M. REMSEN.

A NEW ESOPHAGOSCOPE. Richard Lewisohn in the Annals of Surgery, January, 1913.

Lewisohn shows an new esophagoscope which will be recognized by any one who is at all familiar with the older instruments as a distinct step forward. It is a right angular, telescopic instrument which may be introduced with the patient in the normal position with little difficulty. An aspirator, electric light, etc., is connected with this instrument so that some remarkable pictures of the esophagous, which are shown in his article, are obtained. A report of some interesting cases is given in conjunction with the operative findings and proves the value of this ingeniously contrived instrument.

C. M. REMSEN.

THE CLASSIFICATION OF ARTHRITIS. John McWilliams Berry in Surgery, Gynecology and Obstetrics, January, 1913.

The author points out the confusion in classification, especially in chronic cases, and shows that it has been due to the improper knowledge of the etiology, lack of understanding of the pathological findings and the ambiguity arising from individual observers describing the same condition under different names. Present classifications divide such cases in hypertrophic and atrophic headings, and place the various forms, as recognized clinically, under one or the other of these headings. Clear radiographs accompany his article. His classification is as follows:

A Traumatic.
  1. Traumatic Arthritis.
    a Simple traumatic inflammation.
    b Villous arthritis.
  2. Traumatic Osteoarthritis.
    a Bony spurs.
    b Proliferative oseoarthritis in hallux valgus, in joints subject to irritation of foreign bodies.
    c Heberden's nodes.
    d Proliferative osteoarthritis of the knees.
    e Malum coxae senilis.
    f Spondylitis deformans.

B Infectious.
  1. Infectious Arthritis Caused by Organisms.
  2. Infectious Osteoarthritis Caused by Organisms.

C Trophic.
  1. Trophic Arthritis. Metabolis Arthritis.
  2. Trophic Osteoarthritis.
    a Charcot joint.
    b Gout.
    c Syrigomyelia.
    Rheumatoid Arthritis, atrophic arthritis, metabolic osteoarthritis.

INTRAVENOUS INJECTION OF PARALDEHYDE AS AN ANAESTHETIC. H. Noel and H. Souttar in Annals of Surgery, January, 1913.

Five to 15 c.c. of Paraldehyde is mixed with an equal amount of ether and dissolved in 150 c.c. 1 per cent NaCl solution. Injection by the Files and MacIntosh Salvarsan apparatus. The fluid is driven into the veins at about 5 to 10 c.c. per minute. In five seconds patient tastes Paraldehyde; in ten seconds it is noticed on his breath; in twenty seconds a sensation of dizziness; in thirty seconds consciousness disappears; in sixty seconds there is deep unconsciousness, and in ninety seconds the corneal reflex is gone and anaesthesia is complete, though reflex movements may occur. Sleep lasts from twenty minutes to several hours, from which there are no after-effects. Strikingly useful in acute and chronic alcoholics, where sleep may be induced in sixty seconds. Drug is excreted very rapidly by lungs and is, therefore, deemed by the authors as a very safe anaesthetic. When deeper anaesthesia is required it is suggested to add chloral or bromides, administering these by rectum or nose.

SOUTHERN MEDICAL NEWS

SOUTHERN MEDICAL NEWS.

A large number of County Medical Societies in the territory covered by the Southern Medical Association have elected officers to serve during the year 1913, a few of which are now able to report. In Alabama we learn that the following new officers are installed:

ALABAMA.

Lauderdale County—Dr. L. W. Desprez, President; Dr. R. M. Davis, Secretary-Treasurer. Their address is Florence.

Jefferson County, Birmingham—Dr. Henry Silas Ward, President; Dr. C. E. Dowman, Jr., Secretary-Treasurer.

Madison County, Huntsville—Dr. James F. Burnham, President; Dr. Edgar Rand, Secretary-Treasurer.

Etowah County, Gadsden—Dr. A. W. Ralls, President; Dr. M. P. Hughes, Secretary-Treasurer.
Mobile County, Mobile—Dr. H. Von Ezdorf, President; Dr. W. W. Scales, Secretary.
Tuscaloosa County, Tuscaloosa—Dr. G. H. Searcy, President; Dr. Joseph A. Maxwell, Secretary-Treasurer.
Butler County, Greenville—Dr. W. E. Morris, of Georgiana, President; Dr. L. V. Stabler, of Greenville, Secretary-Treasurer.
Calhoun County, Anniston—Dr. T. J. Brothers, President; Dr. I. P. Levi, Secretary-Treasurer.
St. Clare County, Odenville—Dr. W. B. Johnson, of Asheville, President; Dr. J. P. Hawkins, of Ragland, Secretary-Treasurer.
Perry County Marion—Dr. R. C. Hanna, President; Dr. J. B. Hatchette, Secretary-Treasurer.
Dallas County, Selma—Dr. E. B. Ward, President; Dr. B. B. Rogan, Secretary-Treasurer.
Houston County, Dothan—Dr. M. S. Davie, President; Dr. W. C. Howell, Secretary-Treasurer.

Dr. Thomas Hughes, of Russellville, was recently thrown from his buggy in a runaway and sustained serious injuries, including the fracture of his left leg.

On November 27, at Gadsden, Mr. J. E. Leach was attacked and beaten while making a professional call.

Dr. W. S. Haddox, of Arnold, who was shot from ambush recently, is recovering.

The managers of the Physical Department of the Y. M. C. A. at Mobile have secured the services of ten or twelve prominent physicians of that city to deliver a series of popular lectures on hygiene, sanitation and kindred topics during the winter months.

LOUISIANA.

Three series of courses in sanitary science were started at Tulane this session for students of medicine and of engineering science. The object is to provide competent men for membership on boards of health, sanitary biology and sanitary engineering. Instruction is given by Prof. Derickson, late of Cornell, and Dr. Creighton Wellman and his assistants in the School of Tropical Medicine.

A leper who had resided for some time in Winfield was discovered and sent to the colony at New Orleans. He is a Mexican. The insane leper, Hebert, who recently escaped from the State Leper Home and sought refuge in his own domicile at Lafayette, is still there, but guarded by the Sheriff of Lafayette Parish and his deputies.

The Crowley Sanatorium is now completed and in operation. The officers are: Dr. E. M. Ellis, President; Dr. D. D. Mims, Vice-President; Dr. R. B. Rainey, Secretary-Treasurer.

Dr. Oscar Dowling, President of the State Board of Health, issued a Thanksgiving proclamation supplementary to that of the Governor, but instead of thanking Providence in the usual manner, he thanks some unknown, or at least unspecified power for the "interest in subjects akin to sanitation and preventive medicine" shown by the public and the medical profession, all of which goes to show that with Oscar Dowling the preservation and protection of health is not so much a business as a religion.

Dr. E. M. Hummel, of New Orleans, was severely, though not seriously, injured in a recent auto collision.

VIRGINIA.

On November 27 the Petersburg Medical Faculty elected Dr. E. L. McGill, President, and Dr. W. C. Powell, Secretary-Treasurer. The city of Richmond proposes to establish, in February, an "Open Air School" on the roof of the new Madison Street School Building. On November 28, in the presence of more than a thousand guests, the new home of the University College of Medicine at Richmond was officially opened. A pleasant surprise on the occasion was the presentation of a silver service to Dr. Stuart McGuire, President of the College. It was gracefully delivered by his predecessor, Dr. J. Allison Hodges, "on behalf of the Board of Trustees and the faculty."

Dr. Allen W. Freeman, of Richmond, is one of the speakers who, under the direction of the State Health Department, will speak to the public on topics of hygiene and sanitation.

KENTUCKY.

Dr. E. C. Roemele, of Frankfort, is reported to be recovering from the injury received in

a collision on the pike December 23.

Dr. A. J. Clements, of Glasgow, who has been adjudged insane, was committed to Lakeland State Hospital.

At the Hazlewood Sanatorium, near Taylor Boulevard, in Louisville, a boiler exploded, November 25. Fire resulted and the building in which the accident occurred, which was the kitchen and laundry, was destroyed. Fortunately no one was injured, and the patients were not removed from the institution.

The Martinsvill Sanatorium, Louisville, was seriously damaged by fire October 20.

Drs. J. N. and A. T. McCormack and Lillian H. South have sold St. Joseph's Hospital, at Bowling Green, to Dr. T. O. Helm, including franchise and equipments.

Dr. John G. Cecil has resigned his position on the Executive Committee of the Medical Department of the University of Louisville. He is succeeded by Dr. J. Garland Sherrill.

The Board of Prison Commissioners of Kentucky find that not less than 20 per cent of the prisoners in the state penitentiaries are syphilitics. The present staff is unable to cope with the situation satisfactorily and it is suggested that an "honor man" be sent to each prison by the Medical Department of the Univeristy of Louisville to assist.

Dr. J. H. Lackey, of Canton, has removed to Nashville. A farewell luncheon in his honor was given by his county society, at which many regrets were expressed at his removal. As a member of the Kentucky Legislature he was chiefly instrumental in securing the $30,000 appropriation for the Board of Health.

MISSISSIPPI.

The Board of Health reports that the vital statistics law that became in force November 1 is being observed and obeyed by physicians generally throughout the state. Citizens and schools of the state observed November 20 as "Health Day," wherein, with the aid of the School Improvement Association and the women's clubs, the youth of the state were instructed in the simple rules of hygiene and sanitation.

TENNESSEE.

Certain prominent physicians in Nashville, among them Drs. John A. Witherspoon, G. C. Savage, W. A. Bryan, William Litterer, O. N. Bryan, C. A. Robertson, and James A. Yowell, have organized a company to be called The Wautauga Sanitarium Company, for the purpose of operating a private institution for the care of tuberculosis and tuberculous diseases. They have acquired the fine estate known as "Ridgetop," formerly the property of Mr. Edmund Baxter, together with some 200 acres of land. It has its own waterworks and sewerage system, gas plant, dairy and vegetable farm. The water comes from an inexhaustible cave spring, pure and sparkling. The elevation is about 1,000 feet above sea level. The adjoining territory is to be congratulated upon the establishment of this very necessary adjunct to modern conditions.

BOOK REVIEWS

CYCLOPEDIA OF AMERICAN MEDICAL BIOGRAPHY.

By Howard A. Kelly, M.D., Professor of Gynecologic Surgery at Johns Hopkins University, Baltimore. Two octavo volumes averaging 525 pages each, with portraits. Philadelphia and London: W. B. Saunders Company, 1912. Per set: Cloth, $10.00 net; Half Morocco, $13.00 net.

There is a good and practical reason why every physician who would rise above mediocrity should read the life histories of his professional predecessors who secured the confidence and admiration of their contemporaries. In their day they met and overcame the same obstacles to success that now confront the ambitious worker, and the methods they successfully employed may sometimes prove to be the key to most perplexing situations. Their struggles—for few great men were exempt from early difficulties—and their histories of heroic endurance, are good things to read about when one is passing through the slough of despond, but—and this is the point—they *came through!* And their courage, energy and persistence were appropriately rewarded.

But what medical college teaches its students the biography of such men? "Who's who" publications,

wherein any one can be glorified, and with a portrait, for a price, does not tempt doctor or student any more than the black-faced type in the medical directory, which only indicates that the owner of the name paid so many dollars for the record. Sometimes the undergraduate sees, in a text-book, the name of some man who was prominent in the specialty it teaches, but that is all. He graduates in ignorance of the great minds whose labors have made modern medicine possible. In time he becomes a preceptor and directs his students along the lines of biographical ignorance and indifference traversed by himself. Can we doubt that if he had been taught concening the lives and histories of the great physicians of the past, he would esteem his profession more highly, and instil into the plastic minds of his students an admiration and reverence for its character and aims that would go far towards neutralizing the insidious poison of commercialism that is sapping its vitality and reducing it to the level of a trade.

Such books as the work now under review are the natural antidote for the modern tendency towards surrender to greed for gain, with its slimy train of fee-splitting and graft.

If every applicant for the M.D. degree had to pass an examination, brief but comprehensive, in the medical history and biography for which a score of lectures had prepared him, it would add a dignity, now lacking, to the symbolic parchment. If every medical library of any pretensions to value carried the American Cyclopedia of Medical Biography on its shelves it would speak well for its possessor. It begins with a brief history of the leading departments of medical study, anatomy being, of course, the first. After the history of medicine, which occupies comparatively but few pages, the remainder of the two volumes is completed with a succession of biographies of departed physicians. Their life histories are condensed but ample, and free from the extravagant laudation seen in mercenary publications. The portraits are authentic and full of human interest. The press work is strong and good.

The only thing about the whole that the reviewer would like to see otherwise is the small number of Southern physicians recorded compared with those from other parts of the country. This is not the fault of either Dr. Kelly or his collaborators. It resulted from the modesty of the average Southern doctor of the olden time, and his indifference to the approval of any save his immediate patrons and friends. He shrank from publicity and, as a rule, was only forced to face it by a sense of duty that would not be denied. Thus a Sims was self-compelled to sacrifice all his personal preferences to demonstrate to his professional brethren away from home how to relieve their patients from what had always been an endless discomfort and, sometimes, torture. Many there were, however, who "hid their light under a bushel" and lived and died unknown except in their own localities, more or less wide in extent, and escaped the widespread appreciation that would have inscribed their names in a "Cyclopedia of Medical Biography."

Such, for instance, was the late George A. Ketchum, of Mobile. During the lives of two generations he was the foremost medical man in his part of the South. Until age and infirmity dulled his faculties he had no peer, no rival, no competitor that could measure up to him in the extent and success of his practice.

He had no time for writing, yet contributed occasional articles to Southern medical journals, theoretical as was then the fashion, but based on clinical observation. He could ill spare time for teaching, yet for over forty years he occupied the chair of "Theory and Practice of Medicine" in a medical college he had almost created, and which is now the "School of Medicine" of the University of Alabama. For forty-five years he lectured on the same days of the week and the same hours of those days on the same subject and in the same lecture room. He impressed his grand personality upon the entire profession of the Southern half of the State of Alabama.

Surely such a life is worthy of respectful remembrance, yet if his name is mentioned in the cyclopedia this reviewer has overlooked it.

It is one of the duties and privileges of the Southern Medical Association to rescue worthy Southern phvsicians from such unmerited oblivion. It is their own organization, intended to insure a forum where such matters as most compelled their attention can be presented and discussed by friendly and harmonious fellow workers; where the problems peculiar to the South can be studied together by those most familiar with them; and to provide for the adequate dissemination of their views and conclusions through the medium of a Medical Journal their very own, and free from the control of anyone but the medical profession of the South.

Such an Association with such a mouthpiece would had it existed half a century ago, have drawn out from men like Ketchum stores of accumulated medical knowledge so rich and abundant that their names would not now be absent from our most trustworthy "Hall of Fame," for such indeed is the American Cyclopedia of Medical Biography. Yes, it is the best and most reliable one extant. Buy it, doctor. You will never regret spending the money to procure it. Your library needs it.

DIAGNOSTIC METHODS.

Chemical, Bacteriological and Microscopical. By Ralph W. Webster, Ph.D., M.D. Second Edition, Revised and Enlarged, with 37 Colored Plates and 164 Other Illustrations. Philadelphia: P. Blackiston's Son & Co. 1912.

Some eminent teacher said, many years ago, that diagnosis was to the physician what his club was to Hercules; it enabled him to overcome his mightiest foes. There was little exaggeration in this poetical expression of the importance of diagnosis. When a doctor knows positively what is the cause of the patient's illness he can soon acquaint himself, from text-book or memory, with the proper measures for relief.

Modern medicine demands far more detailed knowledge of the patient's condition than was the case in past years, but on the other hand it supplies vastly more information leading to that knowledge.

The book under consideration is one of the latest and most efficient guides to correct diagnosis. Its 682 pages are full of valuable data. Over half of the book is occupied with studies of the various secretions, and what they may reveal. Not one of them, from sputum to semen, is neglected.

The blood and its indications occupy two-thirds of

the remainder, while transudates and exudates conclude the study. The plates and other illustrations are excellent, and, in a word, the book is worthy of that full commendation which is never bestowed by this journal until after due consideration.

There can hardly be a practicing physician who would not find help in its pages.

A MANUAL OF CLINICAL DIAGNOSIS.

By Means of Laboratory Methods. By Charles E. Simon, B.A., M.D. Seventh Edition, Enlarged and Thoroughly Revised. Illustrated with 166 Engravings and 25 Plates. Lea & Febiger, Philadelphia and New York.

More than a decade ago the first edition of this book appeared. It came at the moment when experienced physicians were awakening to the necessity and advantages of the laboratory as aid and confirmation to clinical diagnosis, and it received an enthusiastic welcome. All over the country physicians found it a reliable guide in their efforts to keep abreast of the rapidly advancing march of medical knowledge. Its clear instructions, graphic descriptions and artistic illustrations imparted to students and physicians that confidence in themselves and their own knowledge that is necessary to the encouragement of good work.

Edition followed edition, each an improvement on its predecessor as knowledge of biology and pathology advanced, until this, the seventh eddition, records the accumulated knowledge of these subjects up to date of publication.

It fully justifies its peculiar title, for it takes bedside observations as a basis and uses laboratory methods as aids and guides to a thorough understanding of disease and its processes. A conscientious physican can hardly do his work without the aid of some information of this kind, and that contained in this book cannot be excelled.

INTERNATIONAL CLINICS.

A Quarterly of Illustrated Clincial Lectures and Especially Prepared Original Articles. By Leading Members of the Medical Profession Throughout the World. Edited by Henry W. Cottell, A.M., M.D., Philadelphia. Volume II. Twenty-second Series. Philadelphia and London: J. B. Lippincott Co.

The Journal acknowledges the receipt of this valuable volume. Like its predecessor, it is neatly and securely bound in dark crimson cloth, gilt letters. Is editor evidently selects his articles with a view to the present trend of medical interest. For instance the subiects of Pellagra and Poliomyelitis are fully treated in this volume. Some of the fine illustrations of the pellagra eruptions are very much like those that appeared in the "Pellagra Number" of this Journal, sufficiently so to have been "snapped" from the same cases. In the judgment of the reviewer, however, the article on "Intraspinal Anaesthesia," by William A. Steel, M.D., of Philadelphia, is the most attractive in the edition, as not only is the text clear and intelligible, but the seven full-page photo engravings of the entire procedure are almost equivalent to a clinic that can be repeated at the will of the student.

From cover to cover the volume is crowded with valuable matter.

DUODENAL ULCER.

By B. G. A. Moynihan, M.S. (London), F.R.C.S., Senior Assistant Surgeon at Leeds General Infirmary, England. Second edition, enlarged. Octavo of 486 pages, illustrated. Philadelphia and London: W. B. Saunders Co., 1912. Cloth, $5.00 net; half Morocco, $6.50 net.

There is a place for this book in the library, not only of every surgeon, but also of every internist. Fully one-half of the practicing physicians and surgeons of today never heard of such a thing as duodenal ulcer in their medical schools, and too many of them are still uncertain of the significance of certain symptoms which to the up-to-date internist speak plainly of duodenal ulcer. In Moynihan's work every variety of duodenal ulcer from whatsoever cause is discussed, illustrated, and the proper procedures prescribed. Jejunal gastro-jejunal ulcer are also fully considered.

Very much of the book is written in clinical form, different conditions being emphasized by suitable case-histories. The operations recommended are profusely illustrated.

Physically the book, like all those from the Saunders Company, is above criticism.

TEXT-BOOK OF OPHTHALMOLOGY.

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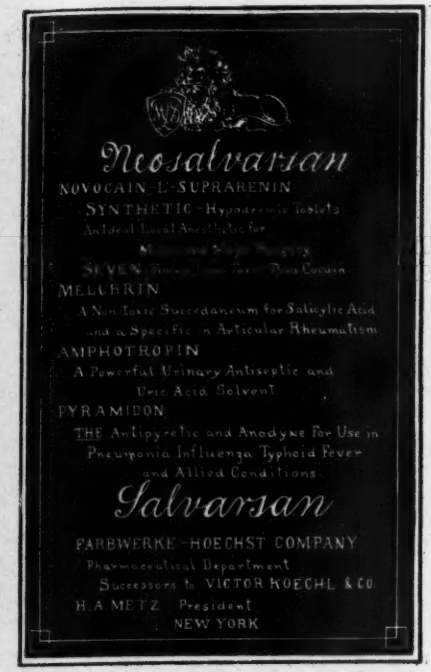

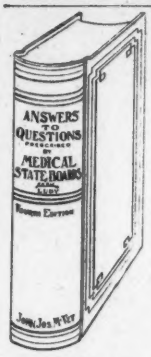

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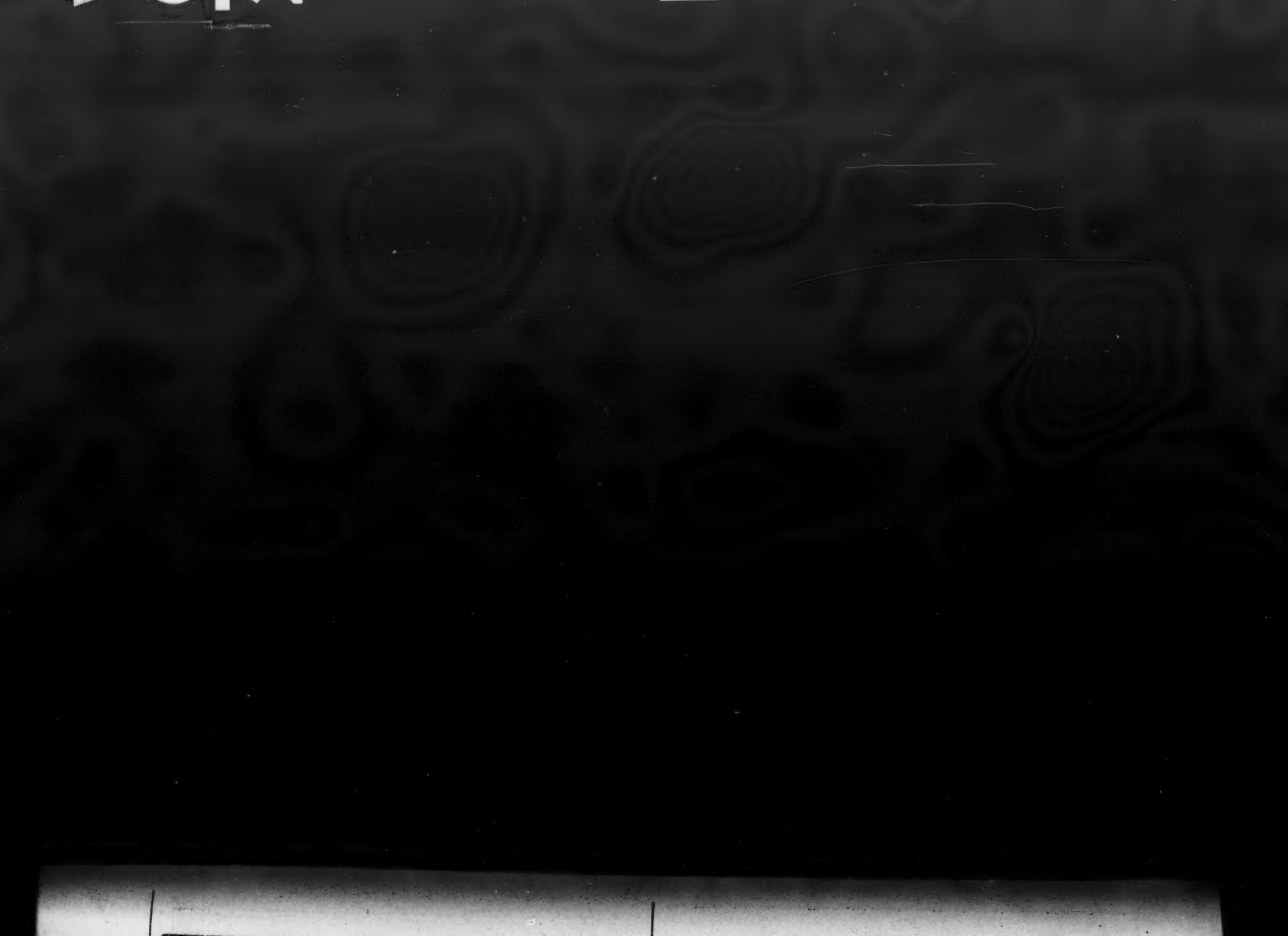

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